A Gender Index for Scotland: Working Paper September 2017

Executive Summary

This working paper describes the process that the Scottish Government has followed to date to explore producing a Gender Index that brings together a range of indicators on inequalities facing both women and men in Scotland. This was a research action identified in the Fairer Scotland Action Plan, published in October 2016. The process so far has involved looking at the scope for replicating an already established index, produced by the European Institute for Gender Equality (EIGE).

The work to date has shown that data limitations make replication of this index problematic and following a process of quality assurance and consultation with a small number of external stakeholders, it has been agreed that it would be preferable to build an index that uses some of the features of the EIGE index, but has a more Scottish appropriate selection of indicators. The Scottish Government is publishing this working paper now to update on progress and to invite those who may have an interest in developing this, and other gender data initiatives, further to get in touch. A workshop is planned for the Autumn and anyone who is interested can contact the Scottish Government: equality-and-poverty-analysis@scotland.gsi.gov.uk.

Contents

1 Introduction

The Scottish Government believes no one should be denied rights or opportunities because of their gender. Everyone in Scotland has a role in reducing and removing the social and economic barriers that result from different expectations and treatment of men and women. The Fairer Scotland Action Plan, published in 2016, had a number of research actions that the Scottish Government committed to taking forward to help evidence what is required to make Scotland a fairer place to live. A Gender Index was one of these actions[1]. This followed a recommendation in a report by Professor Lesley Sawyers for the Scotland Office published in 2015[2].

The Scottish Government publishes equality breakdowns in many of its statistical publications and tools such as the Equality Evidence Finder[3] help to direct users towards detailed information on equality issues.

However for those who aren't experts, but nonetheless have an interest in gender equality, it can be difficult to easily access an up-to-date picture which encompasses the many facets of gender equality. It is hoped that a Scottish Gender Index, when complete, will help fill this gap. The aim is that it will be accessible to the public, the media, and those with an interest in gender equality but who are not able or willing to spend the time researching the published evidence base.

Measurement frameworks have value because they bring together a range of indicators, and by comparing them across places and over time this will help a wider audience to judge whether progress is being made and where key challenges remain. This will also hopefully help this audience to understand that in order to successfully tackle gender issues, such as the gender pay gap, action needs to be taken in many different domains and at different stages of men and women's lifetimes.

This is the first attempt at producing a methodology that will serve this purpose. The work has been coordinated by analysts in Communities Analytical Division in the Scottish Government. From the outset, we envisaged that this first attempt will be primarily a learning experience and that it was likely that we would need to work on this for a number of years before we had a robust complete index. As part of the scoping exercise we looked at the Norwegian Indicators for Gender Equality, which was specifically referenced in the Fairer Scotland Action Plan, and other examples of gender indices. After some research and discussion with stakeholders, we decided to work with the methodology that was created by the European Institute for Gender Equality (EIGE).

EIGE's Gender Equality Index calculates a composite indicator for each EU country that covers a breadth of issues of concern with regards to gender equality, breaking

[1] Fairer Scotland Action Plan, 2016, available here
[2] The Role and Contribution of Women in the Scottish Economy, available here
[3] Scottish Government Equality Evidence Finder, available here

these down into core domains, subdomains, and finally a set of indicators that are monitored over time using existing data sources.

We had originally hoped that EIGE's methodology would provide the blueprint for our own index, which we would be able to use to compare Scotland to other countries across Europe. Although even at the start of this process, we thought there may be merit in adding to the indicators that EIGE use, we had hoped that a degree of comparability could be retained. However, we've conceded that this will not be possible for the majority of indicators due to difference in data availability.

In addition, through an internal process of peer review and following discussions with a small number of stakeholders, there are a number of other changes that we would like to make to improve the coverage of the indicators and their relevance to the Scottish policy context. We therefore have concluded that we may need to sacrifice the limited comparability with EIGE's index in order to produce a more effective set of indicators that better serve the Scottish context.

We are publishing this working paper to provide an update of the work to date, to explain our learning from this first stage of work, and to invite interested stakeholders to contact us so we can build a consensus on next steps.

This paper first provides a brief overview of the EIGE conceptual framework and then looks at the issues identified with following the EIGE methodology. A full technical description of the EIGE methodology and our attempts to duplicate the methodology are included in Annex A .

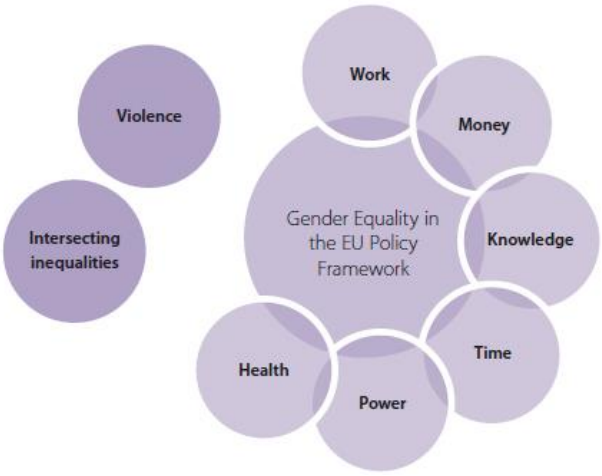
2 Overview of EIGE Conceptual Framework

The European Institute for Gender Equality is an autonomous body of the European Union that was established to contribute and strengthen the promotion of gender equality. The first Gender Equality Index was published in 2013[4], and is updated every two years with improvements made on each publication[5]. Whilst the UK is included, a breakdown to Scotland level is not included. The next index is due to be published in Autumn 2017.

The EIGE Gender Equality Index bases itself on an overarching definition of gender equality based on an: "*equal share of assets and equal dignity and integrity between women and men."* EIGE 2013.

As shown in Figure 1, the index is structured by categorising indicators into 6 core domains covering a wide range of issues. Also included are two domains relating to violence against women and intersecting inequalities. The EIGE index relies on a robust statistical methodology to identify areas that are monitored. The full list of indicators used by EIGE is shown in Figure 2.

Figure 1 – Structure of EIGE Index



Source: EIGE 2013

Overall, the conceptual framework and structure used by EIGE has been extremely helpful and there was general agreement from stakeholders that we consider continuing to use this to help structure the index in future.

[4] Available here
[5] The most recent report, on which most of the subsequent analysis was based, is available here

3 Overview of issues with the EIGE approach in the Scottish context

Through this first stage of work, we have identified some limitations of applying the EIGE methodological framework to Scotland.

The first issue is data availability. This is an issue that often constrains analysis of equality issues. EIGE themselves have not been able to find harmonised pan-European data for some of the areas identified in their conceptual framework, and for some of the other indicators, they identify issues with the data used that may limit the effectiveness of the measure.

Additionally, for some indicators where EIGE do have good data, data either does not exist in Scotland, or is only available for certain time periods and/or for limited age groups. This has been the case for over half of the EIGE indicators. We have therefore been unable to compare Scotland's performance to other EU countries for the bulk of the areas covered by EIGE's methodology.

Because of these factors, we believe there is merit in looking at alternative ways of operationalizing EIGE's conceptual framework using indicators that fit better with the Scottish context and/or data availability. We have concluded that this redevelopment is required before we can present an index that is fit for purpose for Scotland. This will necessitate moving away from some of the EIGE indicators and further sacrificing the limited comparability with EU countries that is currently possible.

We have come to these conclusions following a process of internal peer review and through discussions with a small number of external stakeholders. This process has also helped us to develop suggestions for improvements that can be made. These findings are discussed in more detail in section 4 of this paper.

Figure 2 shows the full list of indicators used by EIGE and substitute indicators that we have considered during this first stage of work. An internal peer review process, and a series of meetings with a small number of external stakeholders reviewed the EIGE/substitute indicators to judge how effective they were in measuring each particular 'concept' that EIGE set out in their conceptual framework. The results of these discussions are summarised in the final column, using a red, amber, green colour code to summarise how satisfied internal and external reviewers were with the effectiveness of the indicator used in measuring gender equality in Scotland.

The rest of this paper provides more detail on why these conclusions have been reached. A more detailed explanation of the data used and data sources are included in Annex A.

Figure 2: Summary of indicator selection and suitability[6]

Key: R (red): substantial concerns have been raised over this indicator and it should be changed; A (amber) some concerns have been raised over this indicator and some modifications may be required; G (green): no substantial concerns have been raised over this indicator.

Domain	Subdomain	Concept measured	EIGE Indicator	Substitute indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Work	Participation	FTE Employment	Full-time equivalent employment (%, 15+population)	Full-time equivalent employment (%, 16+ population)	G
		Duration of working life	Duration of working life (years).	Economic Activity Rate (%, 25 - 64)	R
	Segregation	Sectoral segregation	Employed people in Education, Human Health and Social Work activities (%, 15-64 employed)	Employed people in Education, Human Health and Social Work activities (%, 16-64 employed)	A
	Quality of Work	Flexible personal/family arrangements	Ability to take an hour or two off during working hours to take care of personal or family matters (%, 15+ workers)	Choice in deciding how to do work (% 16+ working population)	R
		Work Intensity	Working to tight deadlines (%, 15+ population)	Unrealistic time pressures at work (% 16+ working population)	R
Money	Financial resources	Earnings	Mean monthly earnings (PPS, 2010 survey)		A
		Income	Mean equivalised net income (PPS, 16+ population)		R
	Economic resources	Poverty	Not-at-risk-of-poverty , ≥60% of median income (16+ population)		R
		Income Distribution	S20/S80 income quintile share (16+ population)		R
Knowledge	Attainment	Tertiary Education	Graduates of tertiary education (%, 15-74 population)	Graduates of tertiary education (%, 18-69 population)	G
	Segregation	Segregation	Tertiary students in the fields of Education, Health and Welfare, Humanities and Art (% of tertiary students)		A
	Lifelong learning	Lifelong Learning	People participating in formal or non-formal education and training (% 15-74 population)	People participating in formal or non-formal education and training (% 15-69 population)	A
Time	Care	Childcare Activities	Workers caring for and educating their children or grandchildren, everyday for one hour or more (15+ workers)	Workers caring for and educating their children or grandchildren, everyday for one hour or more (18+)*	A
		Domestic Activities	Workers doing cooking and housework, everyday for one hour or more (15+ workers)	Workers doing cooking and housework, everyday for one hour or more (18+)*	A
	Social	Sport, culture and leisure activities	Workers doing sporting, cultural or leisure activities outside of their home, at least every other day (15+ workers)	Workers doing sporting, cultural or leisure activities outside of their home, at least every other day (18+)*	A
		Volunteering and charitable activities	Workers involved in voluntary or charitable activities, at least once a month (15+ workers)	Workers involved in voluntary or charitable activities, at least once a month (18+)*	A
Power	Political	Ministerial representation	Share of Ministers (18+ population)		G
		Parliamentary representation	Share of members of Parliament (18+ population)		G
		Regional assemblies representation	Share of members of Regional Assemblies (18+ population)	Share of local councillors (18+ population)	G
	Economic	Members of boards	Share of members of boards in largest quoted companies (by size), supervisory board or board of directors (18+ population)	Share of members of boards in largest (by no. of employees) quoted companies, supervisory board or board of directors (18+ population)	G
		Members of Central Bank	Share of members of Central Bank (18+ population)		A
Health	Status	Self-perceived health	Self-perceived health, good or very good (16+ population)		G
		Life expectancy	Life expectancy in absolute value at birth		G
		Healthy life years	Healthy life years in absolute value at birth		G
	Access	Unmet medical needs	Population without unmet needs for medical examination (16+ population)	Population without unmet needs for medical examination (18+ population)*	A
		Unmet dental needs	Population without unmet needs for dental examination (16+ population)	Population without unmet needs for dental examination (18+ population)*	A
* This data was collected in an omnibus in spring 2017, and therefore does not correspnd to the same dates as EIGE indicators					

[6] Full list of sources is provided in Annex A.

4 Work Domain

"The domain of work measures the extent to which women and men can benefit from equal access to employment and appropriate working conditions. These, together with the elimination of all forms of discrimination and segregation, allow equal access to economic resources and contribute to the elimination of poverty" European Institute for Gender Equality

This domain focusses on paid work, and looks at three key issues of participation, segregation and quality of work. These are high level indicators and of course many more are available for those who want more information[7]. We have not been able to duplicate the EIGE work indicators exactly, and in future may wish to consider reframing the segregation and quality of work indicators to better represent Scottish policy landscape and other frameworks used to monitor the labour market such as the National Performance Framework and measurement frameworks that are in development for the labour market strategy and inclusive growth.

Participation

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Participation	FTE Employment	Full-time equivalent employment (%, 15+population)	Full-time equivalent employment (%, 16+ population)	G
	Duration of working life	Duration of working life (years).	Economic Activity Rate (%, 25 - 64)	R

Gender gaps in participation have narrowed over time, but it is still the case that women are less likely to participate in the labour market. Furthermore, when women do participate, this is more likely to be on a part time basis and they are also more likely to have career interruptions in order to accommodate unpaid caring roles. EIGE capture these issues using two indicators. Participation and part time working is measured through the "FTE employment" indicator. It has been possible to reproduce this indicator for Scotland, although only for the 16+ population.

EIGE measure career interruptions using a calculation of "duration of working life". This measures the number of years that women and men are active in the labour market. This measure reflects career interruptions to accommodate caring responsibilities and other factors that lead to withdrawal from the labour market – for example, full-time education and retirement. This statistic is not currently produced in Scotland, but it should be possible to calculate it in future. We considered a substitute using only economic activity rates but unfortunately this does not capture the same refined detail.

[7] The Scottish Government Equality Evidence Finder provides links to a wide range of sources on gender, available here

Segregation

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Segregation	Sectoral segregation	Employed people in Education, Human Health and Social Work activities (%, 15-64 employed)	Employed people in Education, Human Health and Social Work activities (%, 16-64 employed)	A

There is a well-recognised issue with horizontal (across industries) segregation in the labour market, with women over represented in some areas such as childcare, care for the elderly, nursing and teaching[8]. Vertical segregation (reflecting different levels of career progression) is not directly measured in this domain, but is captured later on in the index through indicators such as earnings and women on boards.

In Scotland, there is a lot of focus on the STEM sectors (science, technology, education and maths), where women are severely under-represented. This is the flip-side of the segregation being measured by EIGE which measures segregation using sectors where women are over-represented. Moving forward, consideration could be given to the Scottish index measuring the STEM sectors to better align with this policy focus. As with the participation indicators, for segregation we are only able to measure those aged 16+.

Quality of Work

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Quality of Work	Flexible personal/family arrangements	Ability to take an hour or two off during working hours to take care of personal or family matters (%, 15+	Choice in deciding how to do work (% 16+ working population)	R
	Work Intensity	Working to tight deadlines (%, 15+ population)	Unrealistic time pressures at work (% 16+ working population)	R

There are many issues related to quality of work that affect both men and women that could be examined and measured. EIGE refers to several pillars of quality of work (referencing Eurofound, 2002) – job security, health and wellbeing of workers, skills and competences, notably their underutilisation, and work life balance.

It is difficult to measure this multi-dimensional issue with a limited number of indicators. EIGE adapted the indicators used between their 2013 and 2015 reports reflecting the challenges of getting this right. The current EIGE indicators are not questions asked by Scottish surveys, and although we considered substituting in two questions from the Scottish Health Survey, stakeholders have commented that these are not wholly satisfactory substitutes. This is discussed further in Annex A. Furthermore, discussion with stakeholders has flagged up other considerations and questioned whether the EIGE indicators are right in the Scottish context. There would be merit in looking at other indicators such as job security (eg. zero-hour

[8] See "The Gender Pay Gap - Update and Analysis of Time-Series Data, published by the Scottish Government, available here

contracts), underemployment, and a different indicator of flexibility (eg. number on flexible working hour contracts).

5 Money Domain

"Assessing the domain of money is important from a gender equality perspective, as ensuring women's and men's equal rights and access to financial resources is a prerequisite for reaching equal economic independence and for addressing the increasing feminisation of poverty specifically and growing income inequalities more generally". European Institute for Gender Equality

The money domain is split into two subdomains covering financial resources and economic situation. Money here refers to earnings and other sources of income such as social security, income from investments etc. Many of the indicators used in this domain are imperfect as most rely on household income data where it is assumed that income from all adults in the household is pooled. This may not always be the case, and therefore this limits the effectiveness of these indicators in measuring access to financial resources and economic independence. Both subdomains are considered together due to the over-arching issues with income data sources that is common across both.

Financial Resources & Economic Situation

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Financial resources	Earnings	Mean monthly earnings (PPS, 2010 survey)		A
	Income	Mean equivalised net income (PPS, 16+ population)		R
Economic resources	Poverty	Not-at-risk-of-poverty , ≥60% of median income (16+ population)		R
	Income Distribution	S20/S80 income quintile share (16+ population)		R

As a result of the issues highlighted in the work domain, women's average earnings are lower than men's. The measure used by EIGE will pick up both the hourly earnings gap and the fact that women work fewer hours than men over a monthly period (as more women work part time). Debate on the pay gap in Scotland tends to focus on the first of these issue - the hourly pay gap, because it separates out the issue of women working shorter hours on average from the issue of women receiving lower pay per hour on average. It may be worth considering in future whether it is appropriate to adapt this indicator to better align with our published statistics and research on the issue.

As already discussed, the remaining indicators in the money domain are based on household data and assume all adults in a household pool income. This therefore produces a confusing and potentially misleading picture of women's access to financial resources and their economic situation. For future development of this index, options including limiting analysis to single adult household or looking further at breakdowns of income (e.g. pensions) could be considered.

6 Knowledge Domain

"The domain of knowledge examines differences between women and men in their access to and participation in education and training. This includes an assessment of equal access to and attainment of education, the presence of gender segregation in educational fields and provision of lifelong learning for both women and men." European Institute for Gender Equality

This domain is split into three areas – attainment, segregation and lifelong learning. Although we were able to broadly duplicate the EIGE indicators (although as with the work domain there were some issues with duplicating age groups), discussions internally and with stakeholders highlighted possible amendments to these indicators in future to better reflect the Scottish policy context and to ensure that there is no ambiguity over what is being measured.

Attainment

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Attainment	Tertiary Education	Graduates of tertiary education (%, 15-74 population)	Graduates of tertiary education (%, 18-69 population)	G

This indicator measures the proportion of men and women who complete tertiary education, which captures those who complete HND/HNC level all the way up to PhDs. Although we are unable to replicate the same age group, we can broadly measure the same concept as EIGE.

Segregation

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Segregation	Segregation	Tertiary students in the fields of Education, Health and Welfare, Humanities and Art (% of tertiary students)		A

The subjects studied by men and women differ significantly. This underpins segregation in the labour market, but is also likely to be a product of the observed segregation in the labour market which shapes gender norms for successive generations.

As discussed in the work section, due to the focus on STEM subjects in Scotland, it may make sense to realign the indicator to those subjects. Consideration of earlier stages of education and other forms of vocational training (e.g modern apprenticeships) could also be useful.

Lifelong learning

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Lifelong learning	Lifelong Learning	People participating in formal or non-formal education and training (% 15-74 population)	People participating in formal or non-formal education and training (% 15-69 population)	A

This indicator aims to capture education and training beyond compulsory education. The question used attempts to capture all education and training other than self-learning.

Data available for Scotland differs slightly from the data used by EIGE and in future we may wish to make further changes to the age group captured to ensure that we are not measuring children still in compulsory education. Stakeholders also raised questions over whether the descriptions are too ambiguous, in particular the term 'non-formal learning'.

7 Time Domain

"The domain of time aims to capture the gendered nature of the way in which individuals allocate their time between economic, care and social activities. It is an important area from a gender perspective given the imperative to ensure better work–life balance for women and men." European Institute for Gender Equality

This domain captures key indicators that help explore underpinning factors in many other inequalities highlighted in this index, in particular the unequal division of caring responsibilities. This domain also looks at time spent undertaking social activities.

The Scottish Government does not have an existing survey which captures time use but we are now looking for ways in which we can gather this data in future. To replicate the data used by EIGE, we used an omnibus survey of around 1000 participants to gather the same information. More detail on this survey is available in Annex A.

Care

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Care	Childcare Activities	Workers caring for and educating their children or grandchildren, everyday for one hour or more (15+ workers)	Workers caring for and educating their children or grandchildren, everyday for one hour or more (18+)	A
	Domestic Activities	Workers doing cooking and housework, everyday for one hour or more (15+ workers)	Workers doing cooking and housework, everyday for one hour or more (18+)	A

The two indicators used to measure care capture care of children and unpaid work carried out in the home. Although the results confirmed that women spend more time on caring for children and carrying out domestic activities, stakeholders questioned

whether the level of granularity is sufficient in order to uncover the extent of disparities in time use. In particular, in relation to caring for children, 1 hour a day is not an onerous obligation and there may be ambiguity over what is meant by 'caring and educating'.

Social

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Social	Sport, culture and leisure activities	Workers doing sporting, cultural or leisure activities outside of their home, at least every other day (15+ workers)	Workers doing sporting, cultural or leisure activities outside of their home, at least every other day (18+)	A
	Volunteering and charitable activities	Workers involved in voluntary or charitable activities, at least once a month (15+ workers)	Workers involved in voluntary or charitable activities, at least once a month (18+)	A

Again, stakeholders were interested in seeing more detail underneath these questions to understand the type of activities these relate to. This could be explored in a more in depth time use survey.

8 Power Domain

"The domain of power focuses on the representation of women and men in decision-making positions, as there is a general consensus that greater gender balance in positions of power will have a positive effect on gender equality." European Institute for Gender Equality

EIGE identified three sub-domains – political, economic and social power, but did not find sufficient indicators to cover the latter of these sub-domains. The Power domain already has many useful indicators, but we could consider adapting the list of indicators in future.

For example, EIGE currently measure members of private sector boards, but this could be expanded to look at members of public and third sector boards. These three measures are used to measure progress towards the 50:50 gender equality on boards by 2020 commitment.

Political Power

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Political	Ministerial representation	Share of Ministers (18+ population)		G
	Parliamentary representation	Share of members of Parliament (18+ population)		G
	Regional assemblies representation	Share of members of Regional Assemblies (18+ population)	Share of local councillors (18+ population)	G

Both the ministerial representation and parliamentary representation are indicators which are available in Scotland. In line with the EIGE guidance, for countries where

there is no sub-national parliaments, representation at local government level is used to measure the regional political representation.

Economic Power

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Economic	Members of boards	Share of members of boards in largest quoted companies (by size), supervisory board or board of directors (18+ population)	Share of members of boards in largest (by no. of employees) quoted companies, supervisory board or board of directors (18+ population)	G
	Members of Central Bank	Share of members of Central Bank (18+ population)	(not available)	A

As discussed previously, the gender share of members of public sector boards is part of the 50:50 by 2020 commitment, and we considered using same proposed measure of number of employees to identify the largest companies. This differs from the EIGE methodology which uses size as determined by listing on the FTSE (or equivalent). As Scotland does not have a central bank, we have used the Bank of England Monetary Policy Committee given they represent economic decision making that directly affects Scotland. In future, more consideration could be given to an appropriate substitute.

9 Health Domain

"One of the main issues of gender and health relates to the necessity to go beyond the biological aspect of health and consider the impact of gender on women's and men's health (Annandale and Hunt, 2000), where strong gaps persist…. The domain of health is important to gender equality because it is positively related to economic independence and increased bargaining power in the household for women" European Institute for Gender Equality

The domain of health is split into three sub-domains: health status, behaviours and access to health. As with the Power domain, EIGE have only been able to find gender disaggregated data for two out of the three sub-domains, and therefore there are no indicators for health behaviour. A future Scottish index could look at filling this gap using data from the Scottish Health Survey on smoking, alcohol and/or diet.

Status

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Status	Self-perceived health	Self-perceived health, good or very good (16+ population)		G
	Life expectancy	Life expectancy in absolute value at birth		G
	Healthy life years	Healthy life years in absolute value at birth		G

These indicators look at physical and psychological health status which may stem from both biological differences and a variety of other factors - for example socio-economic status and employment sector. The indicators used by EIGE are easily replicable for Scotland from robust data sources.

Access

Subdomain	Concept measured	EIGE Indicator	Substitute Indicator (if applicable)	Indication of suitability (EIGE indicator or subsitute)
Access	Unmet medical needs	Population without unmet needs for medical examination (16+ population)	Population without unmet needs for medical examination (18+ population)	A
	Unmet dental needs	Population without unmet needs for dental examination (16+ population)	Population without unmet needs for dental examination (18+ population)	A

Although the Scottish Health Survey had a question on difficulties in relation to dental treatment, we had no indicators that matched well with the question used by EIGE. We therefore asked both of these questions in an omnibus survey of 1000 participants (more information is available in Annex A). Consideration could be given to whether other data sources could provide sufficient data to cover this issue.

10 **Extending the Index**

Development of the index to date has not yet tried to replicate the two additional domains included in the EIGE index. These refer to intersecting inequalities & violence against women. In future development of the index these need to be explored further. These domains are not part of the main index, but contain selected indicators that measure the extent of the issue that women face in these areas. These selected indicators can be measured over time, and across localities, but EIGE do not combine them into the overall index score.

Intersecting Inequalities

Intersecting inequalities refers to groups of women and men who face inequalities due to multiple factors. Ideally, all indicators in the gender index would be able to be disaggregated by other equality protected characteristics (e.g. ethnicity, age, sexual orientation, disability, religion). This would allow us to learn more about groups of women and men who face additional barriers. We would also like to be able to explore particular issues for the transgender community, for which there is very little data available.

Currently, data samples from surveys are often not sufficient to allow this disaggregation. The recently published Scottish Government Equality Evidence Strategy for 2017-2021 points to some of the key evidence gaps[9].

[9] Scotland's Equality Evidence Strategy, available here

However, some disaggregation should be possible for some of the indicators. For example, EIGE's selected indicators on intersecting inequalities uses data from the labour force survey to look at employment rates for minority ethnic people and/or economic migrants, older workers and lone parents/carers. We may be able to replicate this analysis, or we will consider whether we can provide disaggregation across a greater number of indicators included across the core domains.

Violence against women

In Scotland, the Equally Safe strategy, which was updated in 2016, provides a framework to prevent and eradicate violence against women and girls once and for all[10]. Addressing this issue is also a declared goal of the EU institutions and all EU Member States[11].

In EIGE's 2013 report, indicators on violence against women were included but no data was available to report. EIGE's 2015 report included results from a harmonised survey on violence against women that was carried out by the EU Agency for Fundamental Rights in March 2014.

As part of the Equally Safe strategy, a number of data gaps have been identified. The Scottish Government and the Improvement Service are working with Violence Against Women and Girls (VAWG) leads in local authority areas to develop and pilot a comprehensive, shared performance management framework that can be used across Scotland[12].

Future work on the gender index should consider how we can best align with the development of this framework.

Other areas to consider

As well as intersectional inequalities and violence against women and girls, we will consider whether there is a geographical dimension that could be measured – for example, examining an urban/rural split of the data to identify particular issues in different localities in Scotland. Another option to consider is whether the data can be broken down by income decile. Introducing this disaggregation would help to identify whether those who are in lower income decile groups face differential barriers to the rest of the population.

[10] http://www.gov.scot/Publications/2016/03/7926
[11] Section 6 of the 2015 report discusses this area in detail, available here
[12] See page 29 of Scotland's Equality Evidence Strategy for more detail, available here

11 **Conclusion and Next Steps**

The Scottish Government's commitment to develop a Gender Index for Scotland is part of our work to build a strong and accessible evidence base that supports the advancement of equality and opportunity.

Over the last year the Government has worked with a number of key partners to develop the Gender Index. Initial discussion with stakeholders led to a consensus that the best approach was to attempt to replicate a recognised European methodology – the EIGE index. This European methodology uses 6 domains as its foundation and identifies a number of indicators in each domain.

An attempt was made to replicate the EIGE index for Scotland however during this process severe limitations were identified.

- There are EIGE indicators that we have managed to broadly replicate but slight differences in data mean that not all are directly comparable.
- There are EIGE indicators that we cannot replicate but think that they are good indicators. Wherever possible we have identified alternative indicators, with available Scottish data. Again these are not directly comparable.
- There are EIGE indicators where we can provide comparable data but we don't think the indicator is best for the Scottish context. There are options here to develop alternative indicators and potentially additional domains.

Given that this initial phase has shown that it is not possible to replicate a comparable EIGE index for Scotland, it seems appropriate to stop and review current progress, discussing with cross government analysts and stakeholders what the next steps should be. If there is a consensus that additional work is valuable then there is an opportunity to build on the domain approach but tailor it to the Scottish context using improved Scottish specific indicators. It would also give us the opportunity to identify indicators which have local data and thereby provide a more localised picture of gender equality.

Therefore over the next few months the Scottish Government will consult further with stakeholders to discuss how the Scottish Index can be developed into a robust and meaningful data set. We would encourage anyone who is interested in being involved in this process to make contact using the following email address: equality-and-poverty-analysis@scotland.gsi.gov.uk

If there is consensus on how to proceed, the intention is to produce a final index by summer 2018. This allows sufficient time to take on board the findings from our consultative work and to take forward the data gathering and analysis required to produce the index.

12 **Annex A – Technical Annex**

Contents

A.1 Introduction

The European Institute for Gender Equality (EIGE) first produced a Gender Equality Index in 2013, using data primarily from 2010. The aim of EIGE's Gender Index is to provide a comprehensive view of Gender Equality tailored to fit the EU policy context that is comparable between countries and over time.

The reports are available through the EIGE website: www.eige.europa.eu

Here we provide an overview of the EIGE methodology and describe the process we went through in trying to replicate this. Detailed methodological notes are provided by EIGE in their reports published in 2013 and 2015[13], and hence we do not seek to replicate a full explanation here. This annex is written for those with an interest in the technical aspects of the work. A more accessible discussion of lessons learnt and next steps for the future is provided in the main report.

A.2 Key Elements of EIGE's approach

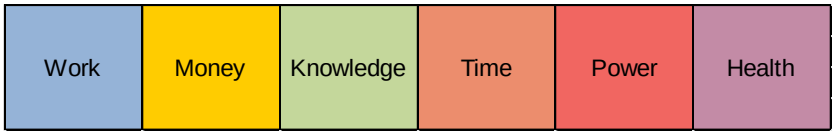
[13] 2013 report: http://eige.europa.eu/sites/default/files/documents/Gender-Equality-Index-Report.pdf
2015 report: http://eige.europa.eu/sites/default/files/documents/mh0215616enn.pdf

EIGE's Gender Equality Index calculates a composite indicator that provides a measure of the complex concept of gender equality. It covers a breadth of issues of concern with regards to gender equality, breaking these down into core domains, subdomains, and finally a set of indicators that are used to measure the different aspects of gender inequality.

A.3 Domains

The following domains were chosen by EIGE following in-depth reviews of gender equality policy documents at EU and international level.

Figure 1. Core Domains

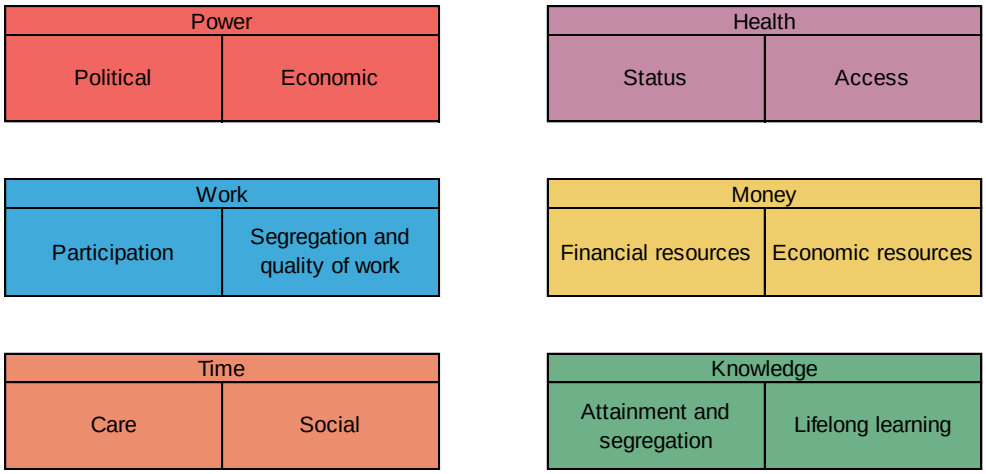


EIGE also include two additional domains on violence and intersecting inequalities. As discussed in the main report, we have not yet looked at full options for replicating these for Scotland.

A.4 Subdomains

Each domain is further divided into sub domains as shown in Figure 2.

Figure 2. Subdomains



A.5 Overview of Indicators

In developing the Gender Index, EIGE used the 10-step methodology on building composite indicators developed by the European Commission's Joint Research Centre and the OECD[14].

The process followed by EIGE is outlined in detail in the first report compiled by EIGE in 2013[15]. To summarise, a long-list of indicators were mapped to a conceptual framework based on the domain and sub-domains, with final indicator choices determined following multivariate analysis to ensure sound statistical structure.

We have deviated slightly from the choice of indicators due to Scottish data availability, but at all times have endeavoured to measure the same or similar concept, and to be as close to the original indicator as possible, so as not to move away from the underpinning methodological basis. In the majority of cases, the only difference is that a slightly different reference population has been used (eg. 18+ rather than 16+). In a very small number of cases, a different indicator has been substituted and this is described further later in this paper.

Where there were no obvious options for substituting indicators, we made use of an omnibus survey method to gather data for a subset of questions. The omnibus survey was used as a last resort as it was only able to provide data for a snapshot in time (March 2017), and therefore is not comparable to the data used by EIGE (2012 and 2015). The omnibus survey was carried out by Progressive Partnership Ltd. Total sample size was 1,027. Fieldwork was undertaken between 14th and 17th March 2017. The survey was carried out online. The figures have been weighted and are representative of all Scottish adults (aged 18+). Questions where the omnibus survey method was used are identified with an asterisk in Figure 3.

Figure 3 also shows the conceptual framework and EIGE indicators, alongside the substitute indicators used for Scotland. The tables that follow provide detailed information on each indicator, how it is measured by EIGE and the approach that SG took to try to replicate the EIGE indicator. The 2015 EIGE report contained some slight modifications to the framework presented in 2013, in particular for the domain of work. Figure 3 reflects this update.

As the main report emphasises, not all of the data used for Scotland is deemed effective for use in a gender index but full detail of the attempts to replicate EIGE indicators for Scotland is included here for completeness and to help with future work in this area.

[14] Handbook on Constructing Composite Indicators, Nardo et al (2008) available at https://www.oecd.org/std/42495745.pdf

[15] http://eige.europa.eu/sites/default/files/documents/Gender-Equality-Index-Report.pdf

Figure 3. Concepts and Indicators

Domain	Subdomain	Concept measured	EIGE Indicator	Suggested substitute indicator (if applicable
Work	Participation	FTE Employment	Full-time equivalent employment (%, 15+population)	Full-time equivalent employment (%, 16+ population)
		Duration of working life	Duration of working life (years).	Economic Activity Rate (%, 25 - 64)
	Segregation	Sectoral segregation	Employed people in Education, Human Health and Social Work activities (%, 15-64 employed)	Employed people in Education, Human Health and Social Work activities (%, 16-64 employed)
	Quality of Work	Flexible personal/family arrangements	Ability to take an hour or two off during working hours to take care of personal or family matters (%, 15+ workers)	Choice in deciding how to do work (% 16+ working population)
		Work Intensity	Working to tight deadlines (%, 15+ population)	Unrealistic time pressures at work (% 16+ working population)
Money	Financial resources	Earnings	Mean monthly earnings (PPS, 2010 survey)	
		Income	Mean equivalised net income (PPS, 16+ population)	
	Economic resources	Poverty	Not-at-risk-of-poverty , ≥60% of median income (16+ population)	
		Income Distribution	S20/S80 income quintile share (16+ population)	
Knowledge	Attainment	Tertiary Education	Graduates of tertiary education (%, 15-74 population)	Graduates of tertiary education (%, 18-69 population)
	Segregation	Segregation	Tertiary students in the fields of Education, Health and Welfare, Humanities and Art (% of tertiary students)	
	Lifelong learning	Lifelong Learning	People participating in formal or non-formal education and training (% 15-74 population)	People participating in formal or non-formal education and training (% 15-69 population)
Time	Care	Childcare Activities	Workers caring for and educating their children or grandchildren, everyday for one hour or more (15+ workers)	Workers caring for and educating their children or grandchildren, everyday for one hour or more (18+)*
		Domestic Activities	Workers doing cooking and housework, everyday for one hour or more (15+ workers)	Workers doing cooking and housework, everyday for one hour or more (18+)*
	Social	Sport, culture and leisure activities	Workers doing sporting, cultural or leisure activities outside of their home, at least every other day (15+ workers)	Workers doing sporting, cultural or leisure activities outside of their home, at least every other day (18+)*
		Volunteering and charitable activities	Workers involved in voluntary or charitable activities, at least once a month (15+ workers)	Workers involved in voluntary or charitable activities, at least once a month (18+)*
Power	Political	Ministerial representation	Share of Ministers (18+ population)	
		Parliamentary representation	Share of members of Parliament (18+ population)	
		Regional assemblies representation	Share of members of Regional Assemblies (18+ population)	Share of local councillors (18+ population)
	Economic	Members of boards	Share of members of boards in largest quoted companies (by size), supervisory board or board of directors (18+ population)	Share of members of boards in largest (by no. of employees) quoted companies, supervisory board or board of directors (18+ population)
		Members of Central Bank	Share of members of Central Bank (18+ population)	
Health	Status	Self-perceived health	Self-perceived health, good or very good (16+ population)	
		Life expectancy	Life expectancy in absolute value at birth	
		Healthy life years	Healthy life years in absolute value at birth	
	Access	Unmet medical needs	Population without unmet needs for medical examination (16+ population)	Population without unmet needs for medical examination (18+ population)*
		Unmet dental needs	Population without unmet needs for dental examination (16+ population)	Population without unmet needs for dental examination (18+ population)*

* This data was collected in an omnibus in spring 2017, and therefore does not correspnd to the same dates as EIGE indicators

A.6 Indicators in the Work Domain

Full-time equivalent employment	
EIGE/Eurostat	Full-Time Equivalent (FTE) employment is a measure that counts employed persons in a way that makes them comparable although they may work a different number of hours. To obtain the measure, each employee's average number of hours worked is first divided by the average number of hours worked by a full-time worker. A full-time worker is therefore counted as one FTE unit, whereas a part-time worker gets a score in proportion to the hours she or he works. For example, a part-time worker working 20 hours a week where full-time work consists of 40 hours is counted as 0.5 FTE units (we can also say that this worker's full-time equivalent is 0.5, that is, this worker is considered equivalent to one-half of a full-time worker). The full-time equivalents of all workers in the workforce of an entity (such as an enterprise, activity, or country) are added up to obtain the FTE employment of this entity. Thus FTE employment is the answer to the following question: If all employees worked full time, how many employees would be required to deliver the same number of working hours as actually delivered by the current workforce (where some people work part time)? The FTE employment rate for a given entity is defined as the FTE employment of that entity divided by the relevant total population. In this dataset, the reference population consists of all individuals aged 15 or over. Data is currently unavailable for 2015.
Scottish Government/ONS	Figures for Scotland are compiled using data from the ONS Annual Population Survey (APS) Jan-Dec for the year in question. Individuals recorded as working full-time in their main job (ftpwk = 1) are given a FTE of 1, while those working part time with a recorded number of total hours work per week (sumhrs) are assigned a FTE value of the number of hours divided by 37.6. There is no employment record for 15 year olds in the APS and therefore the Scottish indicator uses the 16+ population.

Duration of Working Life/Economic Activity Rate	
EIGE/Eurostat	This indicator is obtained from Eurostat's online database [dataset lfsi_dwl_a]. The duration of working life indicator (DWL) measures the number of years a person aged 15 is expected to be active in the labour market throughout his/her life. This indicator is calculated on the basis of a probabilistic model combining demographic data (Life tables available from Eurostat to calculate the survival functions) and labour market data (Labour Force Survey activity rates for each year of age).
Scottish Government/ONS	Data not currently available for Scotland. The substitute data used for this indicator measures the economic activity rate for those aged 25 - 64.. We have taken the economic activity rate for men and women of working age. This indicator is obtained from the ONS APS Jan-Dec for the year in question. A person is economically active if they are either in work or looking for work (i.e. unemployed). Conversely, those who are economically inactive are not in work nor seeking work – for example, because they are in full time education, or care for children or relatives full time.

Employed people in Education, Human Health and Social Work Activities	
EIGE/Eurostat	Calculations are based on the publically-available, country level data in Eurostat's online database [dataset lfsa_egan2]. NACE Rev 2 is the current statistical classification of economic activities used by Eurostat. The following NACE Rev. 2 economic activities are included in the numerator: P (Education) + Q (Human health and social work activities). The denominator is TOTAL (All NACE activities).
Scottish Government/ONS	Figures for Scotland are compiled using data from the ONS Annual Population Survey (APS) Jan-Dec. Activities are determined using the UK Standard Industrial Classification of Economic Activities 2007 (SIC 2007. SIC 2007 is identical to NACE Rev. 2 classifications. The following SIC 2007 economic activities are included in the numerator: P (Education) and Q (Human health and social work activities). The denominator is all individuals in employment (ilodefr = 1). There is no employment record for 15 year olds in the APS and therefore the Scottish indicator uses the 16/64 population.

Flexibility at work/Autonomy at work	
EIGE/Eurostat	Calculations are based on microdata from the European Working Conditions Survey (EWCS), coordinated by Eurofound. The survey aims to represent the population of all employed persons aged 15 or older. The question considered is question Q43 from the 2010 survey: Would you say that for you arranging to take an hour or two off during working hours to take care of personal or family matters is ... ? 1 Not difficult at all; 2 Not too difficult; 3 Somewhat difficult; 4 Very difficult. The indicator is calculated as the percentage of persons who answered "1 Not difficult at all" out of all those who gave a valid answer (1, 2, 3, or 4).
Scottish Government/ONS	Data not currently available for Scotland. The substitute data that is used for this indicator is from the question “choice in deciding how to do work” taken from the Scottish Health Survey. A fuller explanation of why this substitute data was chosen is contained in the main body of this document. The question asked is “I have choice in deciding how I do my work”. 1 Always; 2 Often; 3 Sometimes; 4 Never. The indicator is calculated as the percentage of people who answered "Always" and "Often" (1 & 2) out of all those who gave a valid answer (1, 2, 3 or 4). This question is only asked in the Scottish Health Survey once every two years and is published as combined data for two consecutive survey periods to ensure adequate sample size. To ensure we are measuring progress over time, we have used distinct, rather than overlapping, time periods. Data labelled 2012 is combined data for 2009 and 2011, and data labelled 2015 is combined data for 2013 and 2015. An alternative option, would have been to use a question relating to work/life balance. However, a high score in work/life balance may have related to decisions taken regarding working patterns, rather than the concept of having the flexibility to take time off during normal working hours. We therefore decided to use the question regarding “choice in deciding how to do work” as this implies autonomy in the work place, and the ability to rearrange work priorities if required, which would make it feasible to take time out of the office. We acknowledge that this rationale may not hold in all circumstances, and that we are not measuring exactly the same concept as EIGE, but consider that

	this question is the most appropriate from those asked in the Scottish Health Survey.

Work Intensity	
EIGE/Eurostat	Calculations are based on microdata from the European Working Conditions Survey (EWCS), coordinated by Eurofound. The survey aims to represent the population of all employed persons aged 15 or older. The question considered is question Q45B from the 2010 survey (Q20B_B from the 2005 survey): And, does your job involve working to tight deadlines? 1 All of the time; 2 Almost all of the time; 3 Around 3/4 of the time; 4 Around half of the time; 5 Around 1/4 of the time; 6 Almost never; 7 Never. The indicator is calculated as the percentage of persons who answered 1 to 5 (inclusive) out of all those who gave a valid answer (1 to 7).
Scottish Government/ONS	Data not currently available for Scotland. The substitute data that is used for this indicator is unrealistic time pressures at work taken from the Scottish Health Survey. A fuller explanation of why this substitute data was chosen is contained in the main body of this document. The question asked is “I have unrealistic time pressures at work”. 1 Always; 2 Often; 3 Sometimes; 4 Never. The indicator is calculated as the percentage of people who answered "Always" and "Often" (1 & 2) out of all those who gave a valid answer (1, 2, 3 or 4). This question is only asked in the Scottish Health Survey once every two years and is published as combined data for two consecutive survey periods to ensure adequate sample size. To ensure we are measuring progress over time, we have used distinct, rather than overlapping, time periods. Data labelled 2012 is combined data for 2009 and 2011, and data labelled 2015 is combined data for 2013 and 2015. We are measuring a slightly different concept to EIGE as working to tight deadlines does not always imply unrealistic time pressures” and vice versa. Nevertheless, both questions imply working in a high pressure environment.

A.7 Indicators in the Money Domain

Mean monthly earnings	
EIGE/Eurostat	This indicator is obtained from Eurostat's online database [dataset earn_ses10_20, based on the 2010 Structure of Earnings Survey]. Earnings in this table are expressed in Purchasing Power Standards (PPS). The PPS is an artificial currency unit that can buy approximately the same amount of goods and services in every country. Monetary amounts are expressed in PPS by adjusting the original amounts by international differences in price levels (purchasing power parities). The target population includes workers of all ages who are employed in companies having at least 10 employees and operating in the NACE Rev. 2 sectors: industry, construction and services (except Public administration, defence, and compulsory social security) [B to S, except O]. NACE Rev 2 is the current statistical classification of economic activities used by Eurostat.
Scottish Government/ONS	Figures for Scotland are compiled using data from the ONS Annual Survey of Hours and Earnings. Activities are determined using the UK Standard Industrial Classification of Economic Activities 2007 (SIC 2007. SIC 2007 is identical to NACE Rev. 2 classifications. The population considered is all full time employees aged 16 or over paid a full adult rate

	whose pay has not been affected by absence, working for a company with at least 10 employees and working in sectors defined by the SIC 2007 sections B to S, except O. The result is then converted from pounds to PPS using Eurostat comparative price level data.

Mean equivalised net income	
EIGE/Eurostat	This indicator is obtained from Eurostat's online database [dataset ilc_di03, based on the EU-SILC]. The equivalised disposable (or net) income is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults. Household members are equalised (made equivalent to single adults) by weighting each according to their age and household status, using the so-called modified OECD equivalence scale (assigning a weight of 1.0 to the first adult, 0.5 to each subsequent person aged 14 and over, and 0.3 to each child aged under 14). Income in this table is expressed in Purchasing Power Standards (PPS). The PPS is an artificial currency unit that can buy approximately the same amount of goods and services in every country. Monetary amounts are expressed in PPS by adjusting the original amounts by international differences in price levels (purchasing power parities).
Scottish Government/ONS	Figures are calculated from the Family Resource Survey and the associated Households Below Average Income dataset. As for the EIGE figures analysis is based on net income and uses the OECD equivalence scale. Use of this scale is standard practice although, in order to provide consistency to EIGE figures, household incomes have been equivalised to a single adult standard rather than a 2 adult standard. Equivalised incomes are based on all people in the household but the gender analysis has been limited to those aged 16+. The result is then converted from pounds to PPS using Eurostat comparative price level data.

Not at risk of poverty	
EIGE/Eurostat	This indicator is calculated on the basis of publically available, country-level data from Eurostat's online database [dataset ilc_li02, based on the EU-SILC]. The indicator is equal to 100% - "at-risk-of-poverty-rate". The at-risk-of-poverty rate is the share of all people with an equivalised disposable income (after social transfers) below the at-risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income after social transfers. The equivalised disposable (or net) income is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults. Household members are equalised (made equivalent to single adults) by weighting each according to their age and household status, using the so-called modified OECD equivalence scale (assigning a weight of 1.0 to the first adult, 0.5 to each subsequent person aged 14 and over, and 0.3 to each child aged under 14).
Scottish Government/ONS	Figures are calculated from the Family Resource Survey and the associated Households Below Average Income dataset. Equivalised net income (based on the OECD equivalence scale) has been used which is in line with the EIGE method. The standard UK poverty calculations have been applied which are also believed to be in line with those used

	by the EIGE. The at-risk-of-poverty rate is the share of all people with an equivalised disposable income (after social transfers) below the at-risk-of-poverty threshold, which is set at 60% of the national median equivalised disposable income after social transfers.

Not at risk of poverty	
EIGE/Eurostat	This indicator is calculated on the basis of publically available, country-level data from Eurostat's online database [dataset ilc_di11, based on the EU-SILC]. The formula is (1/"S80/S20 income quintile share ratio")*100%. The S80/S20 income quintile share ratio is a measure of the inequality of the income distribution. It is defined as the ratio of the total income received by the 20% of the population with the highest income (the top quintile) to the total income received by the 20% of the population with the lowest income (the bottom quintile). Because lower inequality is generally preferred to higher inequality, we use the inverse of this measure of inequality as our indicator.
Scottish Government/ONS	Figures are calculated from the Family Resource Survey and the associated Households Below Average Income dataset. Equivalised household incomes are used throughout but have been assigned to each man and woman in the household. Quintiles have been calculated separately for men and women and the S20/S80 ratio is then also calculated separately for men and for women based on these and is then reversed so that a higher number means higher equality.

A.8 Indicators in the Knowledge Domain

Graduates of Tertiary Education	
EIGE/Eurostat	This indicator is obtained from Eurostat's online database [dataset edat_lfs_9904, based on the EU Labour Force Survey]. It shows what percentage of the 15-74-year-old population have completed tertiary education (ISCED'11 levels 5 to 8). ISCED 2011 is the most recent International Standard Classification of Education equivalent. Levels 5 to 8 are equivalent to to Scottish HNC/HND level qualifications and above.)
Scottish Government/ONS	Figures for Scotland are compiled using the Annual Population Survey (APS) variable hiqual15, broken down into ISCED levels to show tertiary education graduates (defined as HNC/HND, Ordinary Degree, Honours Degree, Masters Degree & Doctorate). APS only has data for 16-69 year olds and graduates in employment.

Tertiary Students in the Fields of Education, Health and Welfare, Humanities and Art	
EIGE/Eurostat	This indicator is calculated on the basis of publically available, country-level data from Eurostat's online database [dataset educ_uoe_enrt04, based on administrative data]. Due to a change in classification systems, older data are available in a separate table (based on Eurostat's dataset educ_enrl5). The indicator shows what percentage of all students at the tertiary level are studying in the areas EF14 "Teacher training and education science" + EF2 "Humanities and arts" + EF7 "Health and welfare". Data for 2015 for the EU 28 not currently available.

Scottish Government/ONS	Figures for Scotland are based on the Higher Education Statistics Agency (HESA) publications and uses the Joint Academic Coding System (JACS) to sort students into subject areas. The Eurostat figures are based on a different classification but the best attempt at matching the subject codes has been made. JACS codes used are JACS subject area I (Education), F (Languages), G (Historical & Philosophical Studies), H (Creative Arts & Design), 1 (Medicine and Dentistry), 2 (Subjects allied to medicine) and L5 (Social Work). Students taking more than one subject were split in the counts using Full Person Equivalents.

People participating in formal or non-formal education and training	
EIGE/Eurostat	This indicator is obtained from Eurostat's online database [dataset trng_lfs_09, based on the EU Labour Force Survey]. Lifelong learning encompasses all purposeful learning activity, whether formal, non-formal or informal, undertaken on an ongoing basis with the aim of improving knowledge, skills and competence. The intention or aim to learn is the critical point that distinguishes these activities from non-learning activities, such as cultural or sporting activities. Within the domain of lifelong learning statistics, formal education corresponds to education and training in the regular system of schools, universities, colleges and other formal educational institutions that normally constitute a continuous 'ladder' of full-time education for children and young people. Non-formal education and training is defined as any organised and sustained educational activities that do not correspond to the definition of formal education. Non-formal education and training may or may not take place in educational institutions and cater to persons of all ages. It may cover educational programmes to impart adult literacy, basic education for out-of-school children, life skills, work skills, and general culture. Note that the statistics presented do not cover informal learning, which corresponds to self-learning (for example through the use of printed material, computer-based learning / training, (internet) web-based education or visiting libraries). The data is for the 15-74 age group.
Scottish Government/ONS	Figures for Scotland are obtained using the ONS Labour Fource Survey (LFS) Oct-Dec. Non-formal education and training data is taken from LFS measure lnfr4wk. Formal education and training taken from a mixture of different variables for various kinds of learning to produce comparable statistics to the data reported by Eurostat. The combination of variables only gives values for 15-69 year olds. To replicate as close as possible the EIGE methodology, for a person to be counted as informal or non-formal education under this methodology, at least one of the following applies: 1. INFR4WK = 2 or 3 (non-formal learning undertaken in last 4 weeks) 2. ED4WK = 1 (job-related training or education in last 4 weeks) 3. 0 ≤ SCHM12 ≤ 50 (is on a work scheme) 4. ATTEND = 1 or 2 and 1 ≤ COURSE ≤ 9 (is attending any course other than a self/open learning course) 5. APPRCURRR = 1 (is currently doing an apprenticeship) 6. AGE = 15 (is 15 years old, and therefore still in compulsory education) 7. EDAGE = 96 (has not left school). (From 2016 onwards, INNF4WK should be used instead of INFR4WK in condition 1, and it will be possible to replace conditions 4-7 with the single condition EDUCSTA16 = 1 or 3.)

A.9 Indicators in the Time Domain

Caring for and educating children or grandchildren, every day for one hour or more	
EIGE/Eurostat	Calculations are based on microdata from the European Working Conditions Survey (EWCS), coordinated by Eurofound. The survey aims to represent the population of all employed persons aged 15 or older. The question considered is question EF2C from the 2010 survey (EF4C from the 2005 survey): In general, how often are you involved in any of the following activities outside work: Caring for and educating your children, grandchildren? 1 Every day for 1 hour or more; 2 Every day or every second day for less than 1 hour; 3 Once or twice a week; 4 Once or twice a month; 5 Once or twice a year; 6 Never. The indicator is calculated as the percentage of employed persons who answered "Every day for 1 hour or more" out of all those who gave a valid answer (1 to 6).
Scottish Government/ONS	Figures are from Progressive Partnership Ltd. Total sample size was 1,027. Fieldwork was undertaken between 14th and 17th March 2017. The survey was carried out online. The figures have been weighted to be representative of all Scottish adults (aged 18+). The question considered is: In general, how often are you involved in any of the following activities outside work: Caring for and educating your children, grandchildren? 1 Every day for 1 hour or more; 2 Every day for less than 1 hour; 3 Every other day; 4 Once or twice a week; 4 Once or twice a month; 5 Once or twice a year; 6 Don't know; 7 Not applicable - I don't have children of grandchildren. The indicator is calculated as the percentage who answered "Every day for 1 hour or more" out of all those who gave an answer (1 to 6).

Doing cooking and housework, every day for one hour or more	
EIGE/Eurostat	Calculations are based on microdata from the European Working Conditions Survey (EWCS), coordinated by Eurofound. The survey aims to represent the population of all employed persons aged 15 or older. The question considered is question EF2D from the 2010 survey (EF4D from the 2005 survey): In general, how often are you involved in any of the following activities outside work: Cooking and housework? 1 Every day for 1 hour or more; 2 Every day or every second day for less than 1 hour; 3 Once or twice a week; 4 Once or twice a month; 5 Once or twice a year; 6 Never. The indicator is calculated as the percentage of employed persons who answered "1 Every day for 1 hour or more" out of all those who gave a valid answer (1 to 6).
Scottish Government/ONS	Figures are from Progressive Partnership Ltd. Total sample size was 1,027. Fieldwork was undertaken between 14th and 17th March 2017. The survey was carried out online. The figures have been weighted and are representative of all Scottish adults (aged 18+). The question considered is: In general, how often are you involved in cooking and housework outside work? 1 Every day for 1 hour or more; 2 Every day for less than 1 hour; 3 Every other day; 4 Once or twice a week; 4 Once or twice a month; 5 Once or twice a year; 6 Don't know; The indicator is calculated as the percentage who answered " Every day for 1 hour or more" out of all those who gave a valid answer (1 to 5).

Doing sporting, cultural or leisure activities outside of their home, at least every other day

EIGE/Eurostat	Calculations are based on microdata from the European Working Conditions Survey (EWCS), coordinated by Eurofound. The survey aims to represent the population of all employed persons aged 15 or older. The question considered is question EF2G from the 2010 survey (EF4G from the 2005 survey): In general, how often are you involved in any of the following activities outside work: Sporting, cultural or leisure activity outside your home? 1 Every day for 1 hour or more; 2 Every day or every second day for less than 1 hour; 3 Once or twice a week; 4 Once or twice a month; 5 Once or twice a year; 6 Never. The indicator is calculated as the percentage of employed persons who answered "1 Every day for 1 hour or more" or "2 Every day or every second day for less than 1 hour" out of all those who gave a valid answer (1 to 6).
Scottish Government/ONS	Figures are from Progressive Partnership Ltd. Total sample size was 1,027. Fieldwork was undertaken between 14th and 17th March 2017. The survey was carried out online. The figures have been weighted and are representative of all Scottish adults (aged 18+). The question considered is: In general, how often are you involved in sporting, cultural or leisure activity outside your home outside work? 1 Every day for 1 hour or more; 2 Every day for less than 1 hour; 3 Every other day; 4 Once or twice a week; 4 Once or twice a month; 5 Once or twice a year; 6 Don't know; The indicator is calculated as the percentage who answered "Every day for 1 hour or more"; "Every day for less than one hour"; or "Every other day" (1 to 3) out of all those who gave a valid answer (1 to 5).

A.10 Indicators in the Power Domain

Share of Ministers	
EIGE/Eurostat	This indicator is computed on the basis of the following data: (1) power positions data from the database Women and Men in Decision Making, maintained by the European Commision, DG Justice; (2) population data from Eurostat's online database [datasets demo_pjanbroad and demo_pjan]. The indicator gives the ratio of the number of all government ministers of each sex to the overall population of that sex in the country. The result is expressed as the number of ministers per 10 million of population. (The formula is "Number of ministers"/"Size of population"*10^7.) For the purpose of this calculation, we count as ministers all members of the government, whether or not they have a seat on the cabinet or council of ministers). The data are collected quarterly; we report the first quarter of each year.
Scottish Government/ONS	This indicator is compiled using (1) publicly available data from the Scottish Parliament Information Centre (http://www.parliament.scot/parliamentarybusiness/15446.aspx) on the number of ministers for Scotland in March of each year and (2) population data from the National Records of Scotland mid-year population estimates. The indicator gives the ratio of the number of all government ministers of each sex to the overall population of that sex in the country. The result is expressed as the number of ministers per 10 million of population. (The formula is "Number of ministers"/"Size of population"*10^7.) "Ministers" are defined as the First Minister + Cabinet Secretaries + Ministers. The results relate to the first quarter of the year in question.

Share of Members of Parliament	
EIGE/Eurostat	This indicator is computed on the basis of the following data: (1) power positions data from the database Women and Men in Decision Making, maintained by the European Commision, DG Justice; (2) population data from Eurostat's online database [datasets demo_pjanbroad and demo_pjan]. The indicator gives the ratio of the number of Members of Parliament of each sex to the overall population of that sex in the country. The result is expressed as the number of Members of Parliament per 10 million of population. (The formula is "Number of MPs"/"Size of population"*10^7.) In bicameral systems, both houses of the Parliament are included. The data are collected quarterly; we report the first quarter of each year.
Scottish Government/ONS	This indicator is compiled using (1) publicly available data from the Scottish Parliament Information Centre (http://www.parliament.scot/parliamentarybusiness/15446.aspx) on the number of MSPs in the Scottish Parliament March of each year and (2) population data from the National Records of Scotland mid-year population estimates. The indicator gives the ratio of the number of all government ministers of each sex to the overall population of that sex in the country. The result is expressed as the number of MSPs per 10 million of population. (The formula is "Number of MSPs"/"Size of population"*10^7.) The results relate to the first quarter of the year in question.

Share of Members of Local Government	
EIGE/Eurostat	The indicator shows the sex distribution among all members of regional assemblies. Regional assemblies are representative assemblies of regional authorities that are endowed with self-government. Regional authorities are territorial authorities between the central government and local authorities, but this does not necessarily imply a hierarchical relationship between regional and local authorities. Regional authorities are not applicable in all countries. For countries that do not have regional assemblies (BG, EE, IE, CY, LT, LU, MT, and SI), the Index uses local/ municipal councils (provided as separate tables in this database) instead of regional assemblies. The actual indicator used in the computation of the Index is the ratio of the number of members of regional assemblies to population. The indicator aims to measure the ratio of the number of members of regional assemblies of each sex to the overall population of that sex in the country. However, because only the percentage composition of regional assemblies is available in the WMIDM database, we cannot compute this exact ratio. Instead, the numbers in this table have been computed as 100 million times the ratio of the percentage of women (resp., men) in the regional assemblies to the number of women (resp., men) in the population. The numbers reported are therefore proportional to the ratios of regional assembly members to the population, but not equal to these ratios. However, these numbers can be used in place of the true ratios in the computation of the Index, because their scale cancels out in the computation of the relative gender gaps.
Scottish Government/ONS	As Scotland does not have regional government, local authority data is used, in line with the EIGE methodology explained above. The indicator was compiled using: (1) a list of Councillors and their gender, provided to the Scottish Government by CoSLA and (2) population data from the National Records of Scotland mid-year population estimates. The result is expressed as the number of Councillors per 10 million of population. (The formula is "Number of

	Councillors"/"Size of population"*10^7.) The results relate to the first quarter of the year in question.

Share of members of boards in largest quoted companies, supervisory board or board of directors	
EIGE/Eurostat	This indicator is computed on the basis of the following data: (1) power positions data from the database Women and Men in Decision Making, maintained by the European Commision, DG Justice; (2) population data from Eurostat's online database [datasets demo_pjanbroad and demo_pjan]. The companies covered are the largest publicly listed companies in each country. "Publicly listed" means that the shares of the company are traded on the stock exchange. The "largest" companies are taken to be the members (max.50) of the primary blue-chip index, which is an index maintained by the stock exchange covering the largest companies by market capitalisation and/or market trades. Data cover all members of the highest decision-making body in each company (i.e. chairperson, non-executive directors, senior executives and employee representatives, where present). The highest decision-making body is usually termed the supervisory board (in case of a two-tier governance system) or the board of directors (in a unitary system). The indicator aims to measure the ratio of the number of company board members of each sex to the overall population of that sex in the country.
Scottish Government/ONS	The indicator for Scotland is compiled using the FAME database of largest listed companies in Scotland by number of (UK) employees. This is used instead of the FTSE as the proportion of Scottish headquartered firms on the FTSE 100 is relatively small. Data for 2015 is for the financial year ending April 2015, but as this is a live database, results are not available for the year ending 2012 as the numbers were not being monitored by the Scottish Government at that time. The data is shown as the ratio of the number of company board members of each sex to the overall population of that sex in the country using population data from the National Records of Scotland mid-year population estimates

Share of members of Central Bank	
EIGE/Eurostat	This indicator is computed on the basis of the following data: (1) power positions data from the database Women and Men in Decision Making, maintained by the European Commision, DG Justice; (2) population data from Eurostat's online database [datasets demo_pjanbroad and demo_pjan]. The Central Bank is the entity responsible for overseeing the monetary system for a country. We count the members of all decision-making bodies of each Central Bank. The indicator gives the ratio of the number of Members of the Central Bank of each sex to the overall population of that sex in the country. The result is expressed as the number of Members of the Central Bank per 10 million of population. (The formula is "Number of Members of the Central Bank"/"Size of population"*10^7.)
Scottish Government/ONS	In the absence of a comparable organisation in Scotland, and given that the UK Central Bank also represents the interests of Scotland, we are using the UK figures here.

A.11 Indicators in the Health Domain

Self-perceived health	
EIGE/Eurostat	This indicator is calculated on the basis of publically available, country-level data from Eurostat's online database [dataset hlth_silc_01, based on EU-SILC]. In the European Survey on Income and Living Conditions (EU-SILC), the concept of self-perceived health is operationalised by a question on how a person perceives his/her health in general using one of the answer categories very good/ good/ fair/ bad/ very bad. The indicator is calculated as the percentage of all respondents who assess their health as "Very good" or "Good".
Scottish Government/ONS	Figures are from the Scottish Health Survey, a National Statistics Publication, published by the Scottish Government. 2015 data from published table 2.1, 2012 data from published table 1.1. Each year, participants (16+) are asked to rate their health in general with answer options ranging from ‘very good’ to ‘very bad’. The indicator is calculated as the percentage of all respondents who assess their health as "Very Good" or "Good" to the question

Life Expectancy	
EIGE/Eurostat	Figures are obtained from Eurostat's online database [dataset hlth_hlye]. Life expectancy is computed by Eurostat on the basis of administrative records on mortality. Life expectancy at birth is the mean number of years a newborn child can expect to live if subjected throughout his or her life to the current mortality conditions (age-specific probabilities of dying, i.e. the death rates observed at each age for the current period).
Scottish Government/ONS	In order to utilise one year figures, Life Expectancy figures from ScotPHO in collaboration with ISD Scotland, a division of NHS Scotland, have been used. These are used to compile Health Life Expectancy statistics, an Official Statistics Publication for Scotland. Life expectancy at birth is the mean number of years a newborn child can expect to live if subjected throughout his or her life to the current mortality conditions (age-specific probabilities of dying, i.e. the death rates observed at each age for the current period). There are other Scotland-level life expectancy calculations available. Official statistics are published by the National Records of Scotland based on figures over a 3 year period, e.g. 2013-2015.

Healthy Life Expectancy	
EIGE/Eurostat	This indicator is obtained from Eurostat's online database [dataset hlth_hlye]. The indicator of healthy life years (HLY) at birth measures the number of years that a newborn child is expected to live without any severe or moderate health problems if subjected throughout his or her life to the current mortality and health conditions. If healthy life years are increasing more rapidly than life expectancy, it means that people are living a greater proportion of their lives in better health. As computed by Eurostat, HLY is a composite indicator that combines mortality data with health status data using an algorithm known as the Sullivan method. For this indicator, the notion of health problems is operationalised by

	a question on the EU-SILC that measures the extent to which the respondents, in their own assessment, have been limited in their regular activities due to a health problem during the past six months.
Scottish Government/ONS	Healthy Life Expectancy (HLE) data is published by ScotPHO in collaboration with ISD Scotland, a division of NHS Scotland, and is an Official Statistics Publication for Scotland. HLE at birth is the number of years that a newborn baby would live in 'healthy' health if they experienced the death rates and levels of general health of the local population at the time of their birth, throughout their life. HLE is calculated by combining Life Expectancy and a measure of 'healthy' health: HLE analyses for Scotland the measure used is self-assessed general health (SAH), this is self-reported by survey or Census respondents but has been shown to reflect both mental and physical health. The most robust HLE estimates are based on SAH measured in the Scotland Census. The estimate for HLE at birth for the 5-year period 2009-2013 based on SAH from the 2011 Census (63.1 years) is significantly higher than the single year estimate for 2011 based on SAH from the Scottish Health Survey and Scottish Household Survey (60.4 years). The former is likely to be more accurate because of the far larger sample size in the Census than in the surveys. HLE is calculated using the Sullivan method which applies the prevalence of the ‘healthy’ category (from SAH data) in each age group to the expected number of years lived, to obtain the expected number of years lived in a ‘healthy’ state.

Population without unmet needs for medical examination	
EIGE/Eurostat	This indicator is obtained from Eurostat's online database [dataset hlth_silc_08, based on EU-SILC]. The indicator gives the percentage of respondents of each sex (age group "Total") who have indicated that there has been no occasion during the past 12 months when they needed a medical examination or treatment for a health problem (other than a dental problem) but did not receive it.
Scottish Government/ONS	Figures are from Scottish Government commissioned omnibus survey, completed by Progressive Partnership Ltd. Total sample size was 1,027. Fieldwork was undertaken between 14th and 17th March 2017. The survey was carried out online and the question asked was “Do you have any unmet needs for medical examination”. The figures have been weighted and are representative of all Scottish adults (aged 18+). The proportions are the number of men and women that did not report that they had an unmet medical need.

Population without unmet needs for dental examination	
EIGE/Eurostat	This indicator is obtained from Eurostat's online database [dataset hlth_silc_08, based on EU-SILC]. The indicator gives the percentage of respondents of each sex (age group "Total") who have indicated that there has been no occasion during the past 12 months when they needed a medical examination or treatment for a health problem (other than a dental problem) but did not receive it.

Scottish Government/ONS	Figures are from Scottish Government commissioned omnibus survey, completed by Progressive Partnership Ltd. Total sample size was 1,027. Fieldwork was undertaken between 14th and 17th March 2017. The survey was carried out online and the question asked was “Do you have any unmet needs for dental examination”.. The figures have been weighted and are representative of all Scottish adults (aged 18+). The proportions are the number of men and women that did not report that they had an unmet medical need.

A.12 Normalising the Data

Figures for men and women for each indicator are transformed into a score out of 100. A score of 100 denotes no difference between men and women. EIGE do this using the following steps.

Step 1: Compute the value of the ratio women to the average value, subtract one and take the absolute value to produce a score between 0 and 1 (with the equality point at zero).

Step 2: For reasons of interpretability, the inverse of the indicator is taken, producing a score between 0 and 1 where 1 stands for complete gender equality.

Step 3: For mathematical reasons (to avoid zeros which would impede aggregation of indicators) the final metric is rescaled so that it is bound between 1 and 100.

Figure 4 provides an examples using Life Expectancy data for Scotland in 2015

Figure 4: Worked Example

Scotland 2015			
	Female	Male	Total
Life Expectancy	81.00	76.95	
1. Absolute value of ratio of women to average value -1			0.026
2. 1 +/- (result from 1)			0.97
3. 1 + (2*3) * 99			97.46

The EIGE methodology contains an additional step that takes into account levels of achievement of Member States. For example, a good score for labour market participation would require both a low gender gap, and a high level of participation for men and women combined. EIGE usually calculate this by taking the quotient of the distance for each Member State of its total level in a given indicator to that of the highest performing Member State. Since we have had to substitute many indicators using our different data we have not been able to follow this approach. This distinction means that our final index results are not directly comparable with published EIGE indicators.

A.13 Weighting and Aggregation

In order to arrive at a composite indicator, indicators, then sub-domains and domains need to be aggregated. Indicators were aggregated into sub-domains using the arithmetic mean. Sub domains were aggregated into domains, and the domains into the final index score using the geometric mean, which according to EIGE, minimises compensations between low and high values.

For aggregation to the final index, EIGE relied on experts view on a set of weights, using an Analytic Hierarchy Process (AHP)[16]. The experts consulted consisted of members of EIGE's Working Group on the Gender Equality Index and the EIGE's Expert Forum. The weights used are shown in Figure 5. Whilst for this iteration, we are using these weights, for future iterations of the index, these weighting could be reviewed for the Scottish context with our own stakeholders.

Figure 5. Weights

Work	Money	Knowledge	Time	Power	Health
0.19	0.15	0.22	0.15	0.19	0.10

A.14 Interim results for Scotland

Based on the methodology and our adaptations outlined in this technical annex we have produced a set of indicators for Scotland representing 2015. We have not included results where we have concerns over their effectiveness as indicators (those that are labelled as "red" in Figure 2 of the main paper). The results that are included should not be interpreted as a finished gender index for Scotland and results should therefore only be viewed as interim findings.

None of these results are comparable to headline indicators included in published EIGE reports, which also include a measure of performance (see section 1.6).

[16] This combines both qualitative aspects, by asking to express a preference between two domains, and quantitative aspects, by giving a score to the preference intensity. The AHP is based on ordinal pairwise comparison of domains.

Figure 6: Interim Findings – numbers are scores calculated following process in Figure 4

Work		**Scotland**
Participation	FTE employment	84
	Duration of working life	-
Segregation & Quality of work	Employed people in Education, Human Health & Social Work Activities	47
	Choice in deciding how to do work	-
	Working to tight deadlines	-
Subdomains	Participation	-
	Segregation & Quality of Work	-
Domain	Work	-

Money		**Scotland**
Financial Resources	Mean monthly earnings	88
	Mean equivalised net income	-
Economic Situation	Not-at-risk-of-poverty , ≥60% of median income	-
	S20/S80 income quintile share	-
Subdomains	Status	-
	Access	-
Domain	Money	-

Knowledge		**Scotland**
Attainment & Segregation	Graduates of Tertiary Education	94
	Tertiary students in the fields of Education, Health and Welfare, Humanities and Art	70
Lifelong Learning	People participating in formal or non-formal education and training	97
Subdomains	Attainment and Segregation	82
	Lifelong Learning	97
Domain	Knowledge	89

Time		**Scotland**
Care	Caring for and educating their children or grandchildren, everyday for one hour or more	84
	Doing cooking and housework, everyday for one hour or more	82
Social	Sporting, cultural or leisure activities outside of their home, at least every other day	95
	Involved in voluntary or charitable activities, at least once a month	85
Subdomains	Care	83
	Social	90
Domain	Time	86

Power		**Scotland**
Political	Share of Ministers	83
	Share of members of Parliament	67
	Share of members of Local Government	46
Economic	Share of members of boards in largest quoted companies, supervisory board or board of directors	33
	Share of members of Central Bank	43
Subdomains	Political	65
	Economic	38
Domain	Power	50

Health		**Scotland**
Status	Self-perceived health, good or very good (16+ population)	99.8
	Life expectancy in absolute value at birth	97
	Healthy life years in absolute value at birth	98
Access	Population without unmet needs for medical examination (16+ population)	98
	Population without unmet needs for dental examination (16+ population)	99.7
Subdomains	Status	98
	Access	99
Domain	Health	99

A.15 Conclusion

This technical annex has detailed our attempts to replicate the EIGE methodology. It has shown why it has not been possible to replicate the EIGE methodology sufficiently so that comparisons can be made between Scotland and European countries covered by the EIGE methodology.

The detail presented in this technical annex should provide sufficient information for anyone with an interest in our work to date and will offer a starting point for those who seek to help to develop the index in future.