

SUBMISSION TO ECONOMY, JOBS AND FAIR WORK COMMITTEE THE SCOTTISH PARLIAMENT

Summary

- *The Gender Pay Gap is a persistent factor in the Scottish economy, as it is in all major advanced economies*
- *Over the past decades there has been substantial narrowing Gender Pay Gap, however an earnings gap of approximately 20% still persists. The scope for further reductions could be enhanced through policy measures.*
- *It is difficult to establish whether the gender Pay Gap results in a drag on economic growth.*
- *The Scottish Government should ensure that all parts of the public sector in Scotland, including contractors, are fully complying with the Public Service Equality Duty*
- *The Scottish Government should re-examine the participation of women in high remuneration sectors such as science and engineering.*

Introduction

- 1 The Royal Society of Edinburgh (RSE) welcomes the opportunity to respond to the Inquiry initiated by the Scottish Parliament Economy, Jobs & Fair Work Committee on the Gender Pay Gap.
- 2 The Inquiry focusses on the impact on the Scottish economy. This of course is an important issue, but the RSE also believes that the Parliament should consider aspects that relate to issues of fairness and equality. The Committee should consider the social as well as the economic impacts of the gender pay gap.
- 3 The RSE has considered previously the issue of women's participation and ongoing progression in Science, Technology, Engineering and Mathematics (STEM) and produced a major report on this in 2012¹. While this is not the sole issue relating to the gender pay gap it is

a significant one, given that careers in the STEM sector result in higher earnings for men and women, yet at the time of the report continued participation of women was around half of those of men. Advancement to the most senior levels in STEM employment among women is well below that of men, even in scientific disciplines where women are well represented at the graduate level. The RSE report found that only around 1 in 4 women qualified in STEM continued to work in that sector, while for men it was 1 in 2. While there can be positive reasons why people with STEM qualifications no longer work in that field such a difference in retention is quite remarkable.

- 4 This RSE response will also draw upon the work of Professor David Bell and Dr Tanya Wilson of the University of Stirling, who are currently completing a paper on the gender pay gap and who were both participants in the RSE working group.

The Gender Pay Gap

- 5 The Gender Pay Gap is best measured not by a single statistic that covers only full-time workers, but by a range of measures. There is a number of valid metrics that can be used, each conveying specific advantages but describe different dimensions of the Gender Pay Gap. Weekly/monthly wages paid to people of similar levels of competence and skill is an important measure, but also reflects gender differences in the number of hours worked. The hourly rate illustrates the existence of equal pay for equal work – which has not been fully achieved in the time since the 1970 Equal Pay Act. Annual and lifetime earnings should also be considered, for which there are important public policy considerations, as these impact not only on current earnings, but also on future pension entitlements.

- 6** Self-employment accounts for an increasing proportion of the working population, approximately 12% in Scotland according to the Office of National Statistics. However wage information on the self-employed is not measured as accurately as that for employees. Due to data scarcity, analyses on the gender pay gap are generally limited to employees only, and so overlook a substantial number of workers.
- 7** OECD data indicates that since the 1970s the gender pay gap in the UK, as measured by the difference between male and female full-time earnings, has more than halved, from approximately 48% to 18%. Although this improvement is substantial, the rate by which the gap is closing is decreasing over time. There is scope for active policy to improve the rate of further reductions. However even in Scandinavian countries, which have a reputation for progressive social policies, the gender pay gap has not been fully closed. Even though Sweden has one of the highest female employment rates in the OECD, Sweden still has a gap of around 10%.
- 8** The higher propensity of women to have career breaks due to caring for children or elderly relatives is a major factor impacting upon women's earnings. At labour market entry the gender pay gap is marginal, but increases to approximately 10% after 10 years work experience, after which the gap widens at an increasing rate. By age 45 the difference between male and female weekly earnings is over 25%. This suggests that a focus should be on ensuring that the pay gap does not widen through the age distribution.

The Gender Pay Gap in Scotland ⁱⁱ

- 9** The analysis by Professor Bell and Dr Wilson shows that there has been a narrowing of the gap between men and women in terms of real median weekly pay between 2001–2016. However this has been largely due to real male earnings over the period being no greater in 2016 than in 2001. In particular there is an increase of men employed in low paid and insecure work, rather than a significant improvement in women's pay.
- Both men and women experienced a reduction in the post-2008 period, while women's real weekly earnings recovered slightly more quickly after the financial crisis. In Scotland, for full-time workers, the earnings gap was 18% in 2016, against 27% in 2001.
- 10** In terms of the pay gap for part-time workers the Labour Force Surveyⁱⁱⁱ shows that for part-time workers, women have higher weekly earnings than males, which is likely to be a function of female part-time workers having better qualifications, although this is also the case across almost all age ranges and is not reflected in the earnings of full-time workers. The Labour Force Survey also indicates that part-time work is a voluntary choice for three quarters of women who work part-time. In contrast half of men who are working part-time would prefer to have a full-time job. These preferences are likely to be linked to the gender divide in caring responsibilities. Improvements in flexible and work/life balance practices could facilitate gender equality in working hours.
- 11** The gender pay gap (median weekly earnings) is smaller in Scotland than in the rest of the UK. This may reflect the larger public sector in Scotland. The public sector tends to employ a larger proportion of women than the private sector and the pay gap is smaller in the public sector than in the private sector. This may be due to more centralised pay setting in the public sector where unions are making the case on behalf of their women members. There have been instances in the public sector where forms of employment dominated by women are paid less generously than jobs of comparable skill requirements dominated by men. Nevertheless, there has been no significant narrowing of the public sector pay gap during the last decade.

- 12** Women's employment is more concentrated than is men's in occupations that are often less well paid. Career options are often determined at a young age. Subjects such as physics and computing science, which tend to be associated with higher paying occupations, have relatively low take up among women, though they are well represented in the biological and chemical sciences. However, men are still predominantly in the most senior positions even in these disciplines. The recent impact of the reduction in the number of subjects studied to S4 may even have made this situation worse, with almost all of the sciences experiencing a significant downturn since the change to the National Qualifications. In 2014 girls made up seven per cent of entries for Higher Technological Studies, only 20 per cent of Higher Computing candidates and 28 per cent of entries for Higher Physics. They also accounted for just three per cent of modern apprentices in engineering^{iv}. The Committee may wish to investigate this issue.
- 13** While it might seem to follow that reducing the pay gap would increase economic growth, causality might run in the other direction. Imagine an economic boom caused by expansion in the oil industry. Economic growth would increase and so would the gender pay gap, since the oil industry predominantly employs men. In this case, the gender pay gap is being influenced by economic growth rather than vice versa. One might introduce policies to ensure a more equitable distribution of employment in the oil sector, but until these are effective, there is a tradeoff between higher economic growth (and attendant tax revenues) and the gender pay gap.
- 14** The RSE would also encourage the Committee to consider carefully the possibilities of a focus on inclusive economic growth. As women are the primary carers for children, in most cases, increases in female pay are more likely to have a positive impact on child welfare. The contribution

of women within the household, while more difficult to measure than traditional GDP, is also an economic contribution.

Recommendations

- 15** To address the widening of the gender pay gap over career length, the Scottish Government should seek to encourage practices facilitating equality in opportunities for working over the life course. In addition to the statutory reporting requirement within The Equality Act 2010 (Gender Pay Gap Information) Regulations 2017, the Scottish Government should require firms to publish information on the gender gap at different points in the career ladder – firm entry, mid-level and upper-management. Actions by individual employers to address flexible and work/life balance practices should be incorporated within the Scottish Business Pledge.
- 16** The Scottish Government STEM Education strategy should seek to encourage more young women to study the physical and mathematical sciences, in particular physics and computing science. This needs to start at as early a stage of education as possible, including at primary schools.
- 17** As an employer, but also through procurement of services, the Scottish Government and all parts of the public sector in Scotland should ensure that they are fully complying with the Public Sector Equality Duty.

Additional Information

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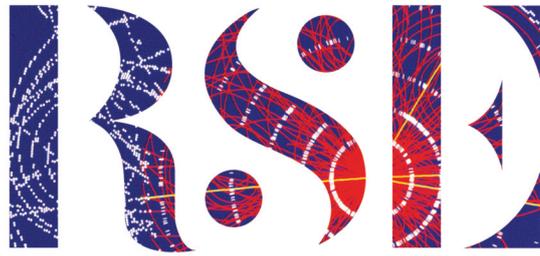
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ⁱ RSE Tapping all our Talents, 2012. <https://www.rse.org.uk/inquiries/women-in-stem/>

ⁱⁱ The Gender Pay Gap in Scotland. David Bell, Tanya Wilson, March 2017.

ⁱⁱⁱ <https://www.ons.gov.uk/surveys/informationforhouseholdsandindividuals/householdandindividualsurveys/labourforcesurvey/ifs>

^{iv} <https://www.holyrood.com/articles/inside-politics/appliance-science-women-stem>



*The Royal Society
of Edinburgh*

KNOWLEDGE MADE USEFUL

THE GENDER PAY GAP IN SCOTLAND

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EXECUTIVE SUMMARY

- The gender pay gap can be measured in various ways. Comparing median gross weekly pay across all workers, in Scotland 2016 the pay difference between men and women was 30%. This difference also reflects that women are more likely to work part time. Internationally, the standard comparison used to calibrate gender pay is that between full-time male and full-time female workers. In Scotland 2016 the gender pay gap for full-time workers was 18%, for part-time workers the gender pay differential was in favour of women by 14%.
- The gender pay gap has narrowed over time. In 1970 the UK pay gap for full-time workers was in excess of 45%. In the past 15 years, predominantly during the Great Recession there has been a substantial decline in gender pay differentials. However rather than an improvement in wages for women relative to men, the recent decline in the gender pay gap has been driven by a larger decrease in real wages for men relative to women.
- On labour market entry, the current gender pay gap is marginal, increases to 10% within a decade, and widens to 20% for full-time workers by age 40. The largest increases in the gender pay gap occur during the prime child-bearing ages.
- Discussions of the gender pay gap for full-time workers typically focus on differences in the skills of male and female workers and on differences in the amount employers are prepared to pay for these skills. Part-time workers have fewer skills than full-time workers because on average they have less work experience and are less qualified. As a consequence, full-time workers are typically paid more than part-timers, and because more males than females work full-time, the overall gender pay gap favours males.
- Higher levels of education command a premium in the labour market due to the associated increased productivity. The gender gap in educational attainment closed over 20 years ago and has been accompanied by a narrowing of the gender wage gap. However, education differences in subject choice persist, with girls and young women significantly less likely to study science and technology subjects and more likely to studying 'female-friendly' subjects. This can result in an increased selection of females into "women's jobs", which may command lower pay.
- Occupational polarisation, where certain occupations tend to employ vastly more women than men, or vice versa, is a contributory cause of the gender pay gap. In addition, a larger share of women's employment is in the public sector, where wages tend to be higher than in the private sector. The gender pay gap is strongly influenced by choice of occupation and sector, which in turn reflects cultural influences and the path taken through the educational system.
- Assessing the causal linkages between the gender pay gap and economic growth is difficult. At different times, GDP growth is driven by different sectors in the economy. If these sectors predominantly employ males, then economic growth will increase the gender pay gap. In contrast, if growth is concentrated in sectors that predominantly employ females, the gender pay gap is likely to contract.

1. INTRODUCTION

Differences in pay between men and women for similar work have been an ever-present feature of the Scottish labour market. They persist even though the Equal Pay Act was passed more than four decades ago. Although the courts have been willing to enforce this legislation, the gap between men and women's pay has narrowed only slowly.

Pay differences between groups of workers arise for many reasons. Individuals vary in their level of skill and in the experience that they bring to the workplace: they face different incentives to work for pay as an alternative to spending their time on other activities, such as looking after children and caring. These incentives may influence decisions to stay in education, invest in skills and to accumulate labour market experience. These actions are themselves conditioned by cultural and societal norms.

Discrimination by employers may also explain pay differences. Kenneth Arrow defined labour market discrimination as "the valuation in the marketplace of personal characteristics of the worker that are unrelated to worker productivity"¹. Employers may discriminate because their customers do not want to be served by some types of worker e.g. ethnic minorities, women, Eastern Europeans. "Statistical discrimination" is perhaps more common, where individuals are discriminated against because of the perceived characteristics of the group to which they belong, which fails to take account of the individual's own talents. Employers may also discriminate due to simple prejudice. Though their roots are different, each of these forms of discrimination may lead to lower average pay for different groups of workers.

Wages offered to workers reflect the prices that their employers can charge for their products. It is often argued that women are concentrated in occupations where product prices are low. This is particularly difficult where no final product is sold on the market, such as in the public sector. Female workers have successfully challenged pay levels in many Scottish local authorities. Their argument has been that pay in "female" jobs has been consistently lower than those in "male" jobs even though the jobs require similar levels of competence and skill.

A related argument, originally attributed to Kuznets², is that measures of economic output should capture activities undertaken by business enterprises, the state and households. However, Gross Domestic Product (GDP) focuses only on business activities and the state. Measuring the output of families is inherently difficult since no monetary exchange takes place. Nevertheless, he argues that correctly accounting for long-term economic growth should include changes in household output. A meal bought in a restaurant is a form of economic activity that contributes to GDP and consumer well-being, so why do the national accounts not similarly account for a meal cooked in the home? Clearly this extension to national income accounting would lead to a quite different assessment of the gender composition of national output.

This paper does not attempt to cover the full range of issues associated with differences in pay between men and women. Instead, it tries to set the background against which such discussions may take place by documenting the recent history of gender pay differences in Scotland. We begin by documenting and comparing methods for describing differences in pay between men and women in Scotland. We present analysis which identifies the extent to which gender pay differences can be attributed to measurable differences in the characteristics of men and women, and how much is left unexplained – and therefore potentially the result of some form of discrimination on the part of

¹ Arrow, K. J. (1973). The theory of discrimination.

² Kuznets, S. (1947). Measurement of Economic Growth. *The Journal of Economic History*, 7(S1), 10-34.

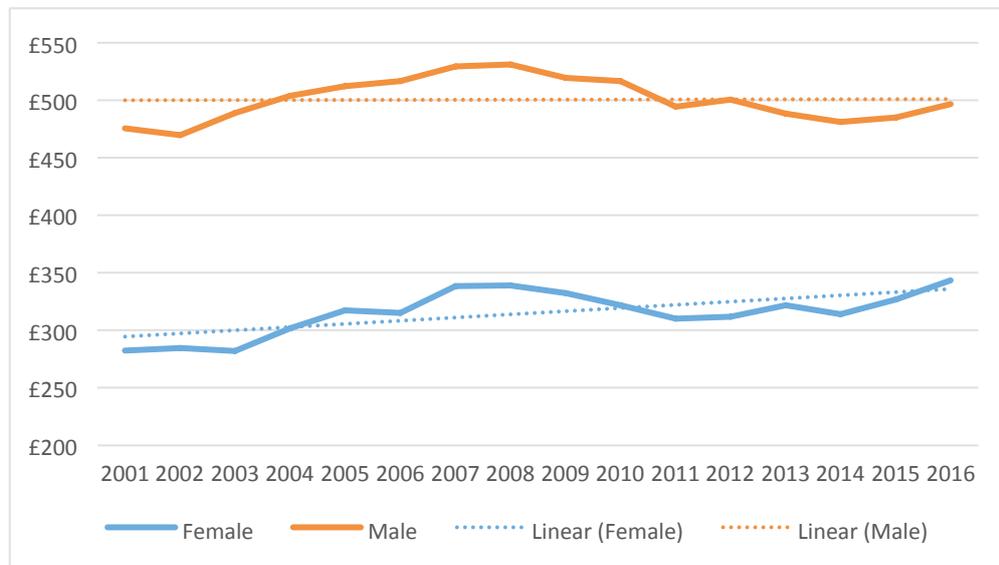
employers. We examine factors that lead to occupational polarisation of workers by gender, and conclude with a discussion of the issues we have highlighted throughout the paper in relation to potential policy measures.

2. THE GENDER PAY GAP IN SCOTLAND

Our statistics are drawn from the Office of National Statistics Labour Force Survey³ over the period 2001-2016. They relate to gross hourly pay, weekly pay and annual pay. They are adjusted to real (2015) values using the Consumer Price Index (CPI) to account for inflation. Individuals participating in the Labour Force Survey are interviewed on five occasions over a 15-month period and then rotated out of the sample. The data is therefore essentially cross-sectional and of limited value in causal inference. Nevertheless, it is the largest regular survey of conditions of work and employment in the UK and provides an accurate perspective on the changing structure of the British labour market.

We begin by considering changes in median gross weekly pay for men and women employees in Scotland between 2001 and 2016 using the Labour Force Survey. These are shown in Figure 1.

Figure 1: Real Median Gross Weekly Pay in Scotland 2001-2016



Source: Labour Force Survey

Several points emerge:

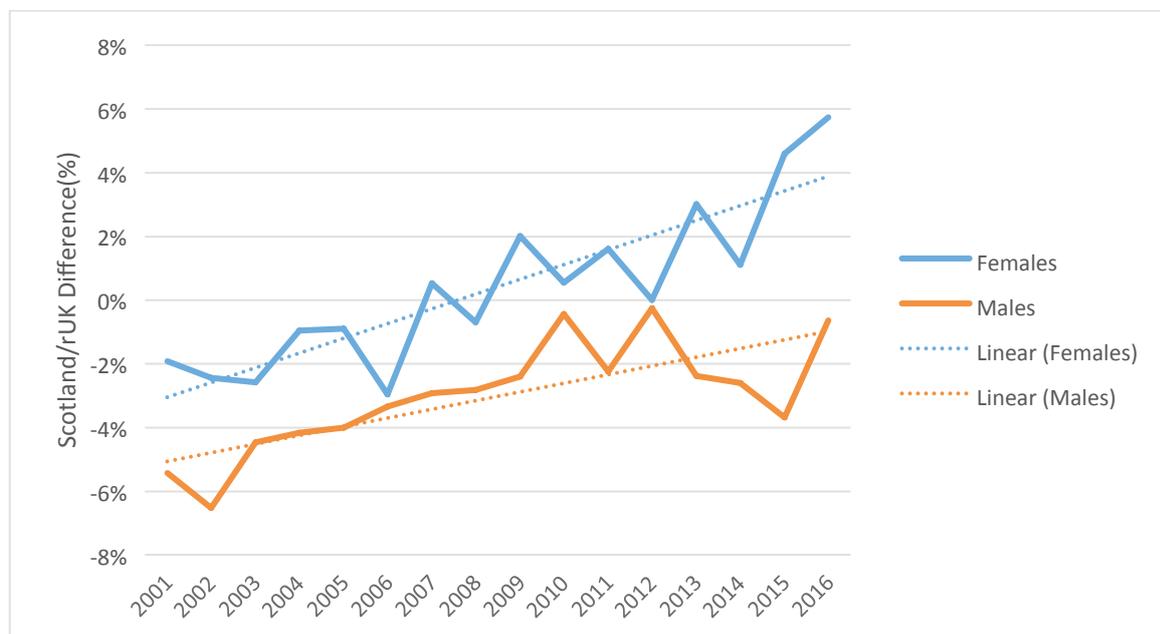
- Median weekly pay for males substantially exceeds that for females. Estimated earnings for men in 2016 were £497 per week, while those for women were £343 per week (both measured in 2015 prices)
- The gap between male and female median pay has been closing, but only slowly. Real weekly pay for men was no greater in 2016 than it was in 2001, while for women it has increased, but only slightly over this 15-year period.
- The real pay of both males and females declined following the financial recession of 2008. For males, real pay is still below its 2008 level.

³ For a description of the Labour Force Survey, see:

<https://www.ons.gov.uk/surveys/informationforhouseholdsandindividuals/householdandindividualsurveys/labourforcesurveylfs>

Figure 2 compares median weekly earnings by gender in Scotland with the rest of the UK (rUK). Female wages are relatively higher in Scotland compared with rUK, while males are somewhat lower. Further, Scottish women's wages are growing relatively faster, compared with rUK, than men's.

Figure 2: Gap between Scottish and rUK Median Weekly Earnings (%)



Source: Labour Force Survey

Returning to Figure 1, it should be noted that the underlying data cover all forms of employment and all lengths of working week. Women are more likely to work part-time than men (of which more later) and therefore have, on average, a shorter working week than men. The difference in wages illustrated in Figure 1 may arise from differences in hours worked, or from a difference in the wage rate or from a combination of the two. In order to disentangle the contribution from these separate effects it is helpful to compare wages across individuals working similar hours. We start with a comparison of full-time workers⁴, which internationally is the standard dimension used to compare gender differences in pay.

2.1 THE GENDER PAY GAP FOR FULL-TIME WORKERS

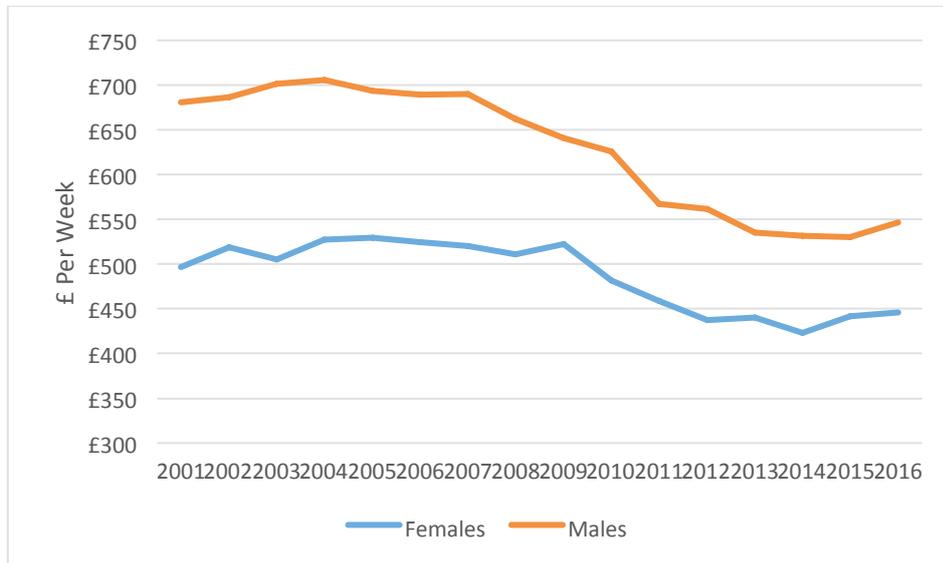
A comparison of the pay of male and female full-time workers broadly eliminates that part of the gender pay gap that is due to differences in average hours worked. The results are shown in Figure 3, which shows that:

- For full timers, real weekly pay in 2016 was significantly below its level in the early part of the last decade.

⁴ The Labour Force Survey asks employees whether they are full-time or part-time. In practice, 94% of those who describe themselves as part-time work less than 30 hours per week, while 96% of those who work more than 30 hours per week describe themselves as full-time. Hence working more than/less than 30 hours is a useful way to characterise the full-time/part-time distinction. See: <http://www.ons.gov.uk/ons/rel/elmr/economic-and-labour-market-review/no--2--february-2007/understanding-statistics-on-full-time-part-time-employment.pdf>

- The gender pay gap has narrowed somewhat over this period. In 2001, full-time women earned 27% less than real median gross full-time male weekly earnings. In 2016, their earnings had increased to 18% below equivalent male weekly earnings.
- This narrowing predominantly occurred in the latter part of the period, during the Great Recession. Rather than an improvement in wages for women relative to men, the decline in the gender pay gap is driven by a larger decrease in real wages for men relative to women. Between 2006 and 2016 male weekly earnings fell by 21%, whereas female earnings decreased by 14% over the same period.

Figure 3: Real Median Gross Weekly Pay for Full-Time Workers in Scotland 2001-2016



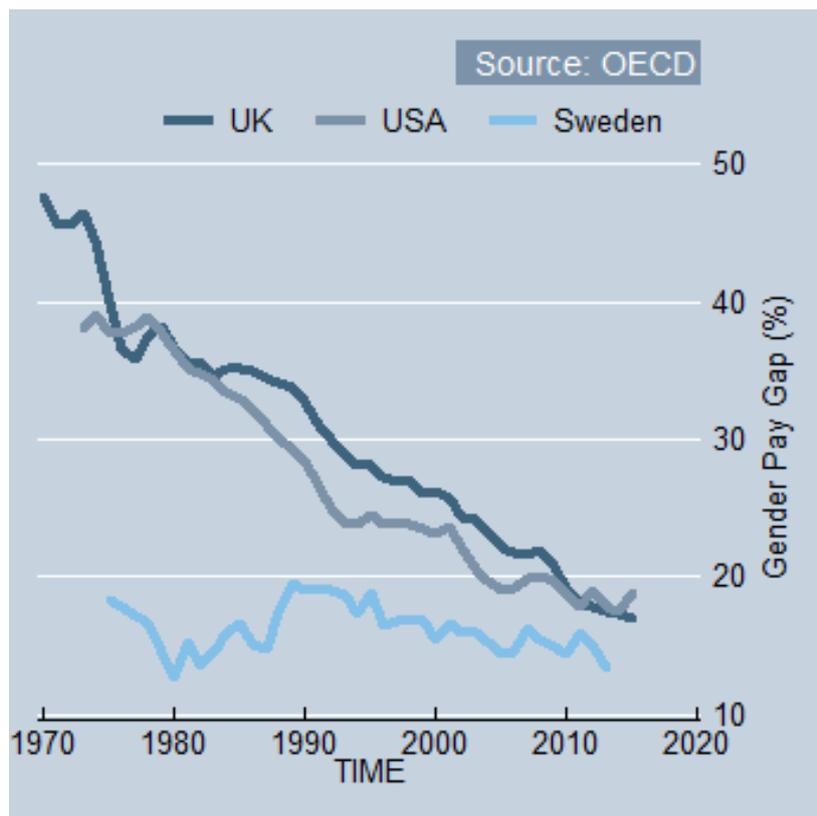
Source: Labour Force Survey

OECD analysis of the gender pay gap focuses on the difference between full-time male and full-time female earnings. Figure 4 shows its evolution for full-time workers in the UK, USA and Sweden. In 1975, the gender wage gap in both the UK and the USA was around 40%. Since then it has narrowed considerably in both countries and in 2015 was down to 17%.

Both the UK and the USA have legislated for equal pay and both have an established legal framework to ensure that discrimination, where it can be identified, is eliminated. Yet progress towards equality of pay levels in both countries has been slow. There is an interesting contrast between the UK and US experience of protracted slow decline in the gender wage gap from that in Sweden, where it has always been smaller than in the less regulated labour markets of the UK and USA. However, the Swedish gap has declined much more slowly than those in the UK and USA and is now around 14%.

The OECD has identified several possible explanations of the persistence of the gender pay gap in Sweden: even though Sweden has one of the highest female employment rates in the OECD and extensive childcare provision, many Swedish women opt for part-time employment after having children. Women are concentrated in fewer occupations than men. This partly stems from gender-biased selection of school subjects. They are also less likely to progress to senior management positions and less likely to be self-employed. Issues such as these may explain the persistence of the gender pay gap in what is recognised to be a society which protects women's rights.

Figure 4: Gender Pay Gaps in the UK, the USA and Sweden



Some of these more difficult issues are relevant to Scotland even though its economy is organised quite differently from the Swedish economy. We consider these later, but first complete the discussion of employment by considering the pay gap for part-time workers.

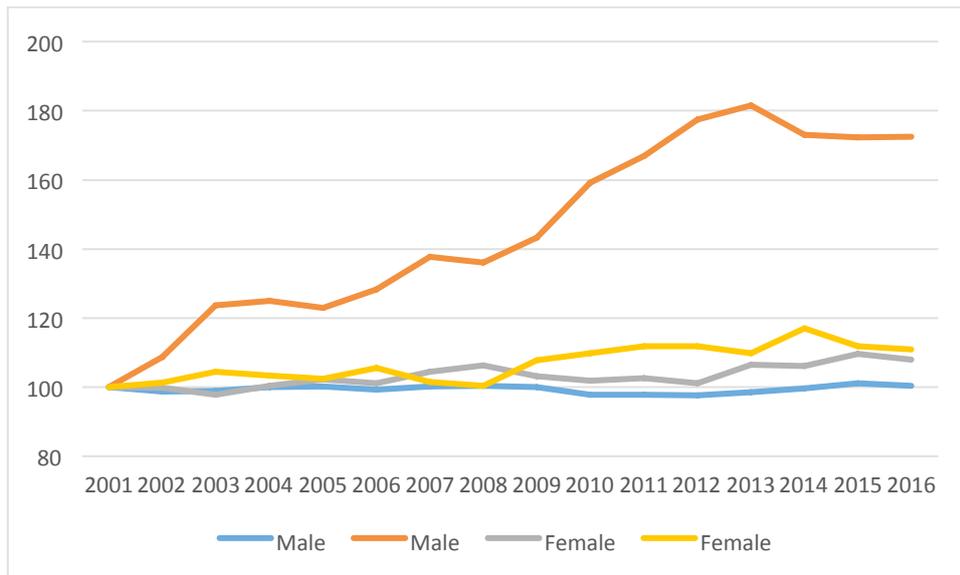
2.2 THE GENDER PAY GAP FOR PART-TIME WORKERS

The commonly accepted international definition of the gender pay gap relates to differences in pay for full-time workers. However, a significant, and growing, proportion of Scottish employees work part-time. This section considers the wages of part-time workers, the reasons why individuals opt to work part-time and how this might affect the gender pay gap.

Part-time working among males has grown strongly since 2008. This is shown in Figure 5, which charts changes in male and female full and part-time work indexed on 100 in 2001. It shows male part-time working has increased much more strongly than other forms of employment throughout this period and in 2016 was approximately 75% above its 2001 level. Female part-time employment has grown by just over 10% during the same period, while male full-time employment in Scotland hardly changed between 2001 and 2016.

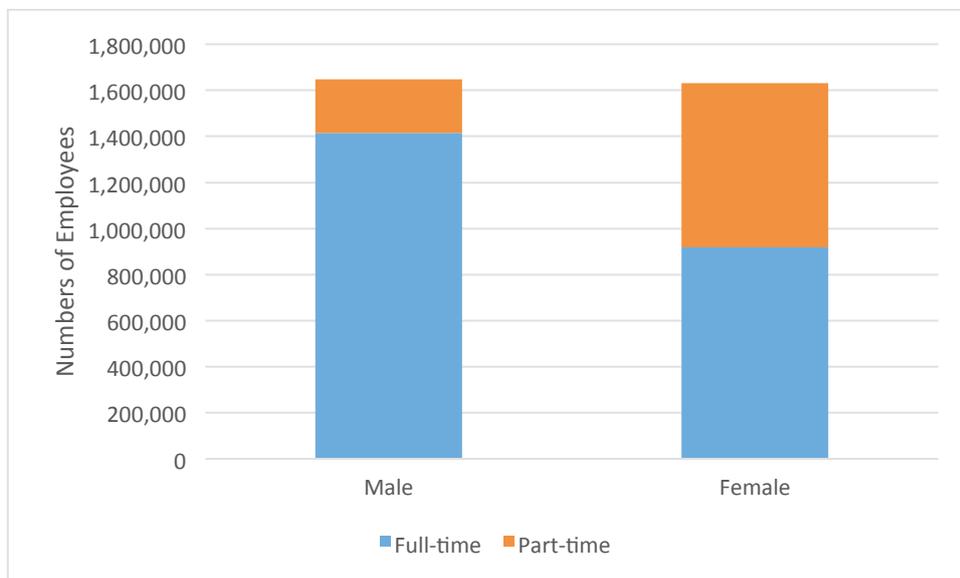
In 2001, male part-time employment was relatively uncommon. Thus, although it has grown strongly in the intervening period, it did so from a relatively low base. Figure 6 shows the distribution of full-time and part-time employment by gender in Scotland in 2015. Even though male part-time working has grown rapidly, it is still the case that females are more likely than males to work part-time.

Figure 5: Increase in Employment by Gender and Full-Time/Part-Time 2001-2016



Source: Labour Force Survey

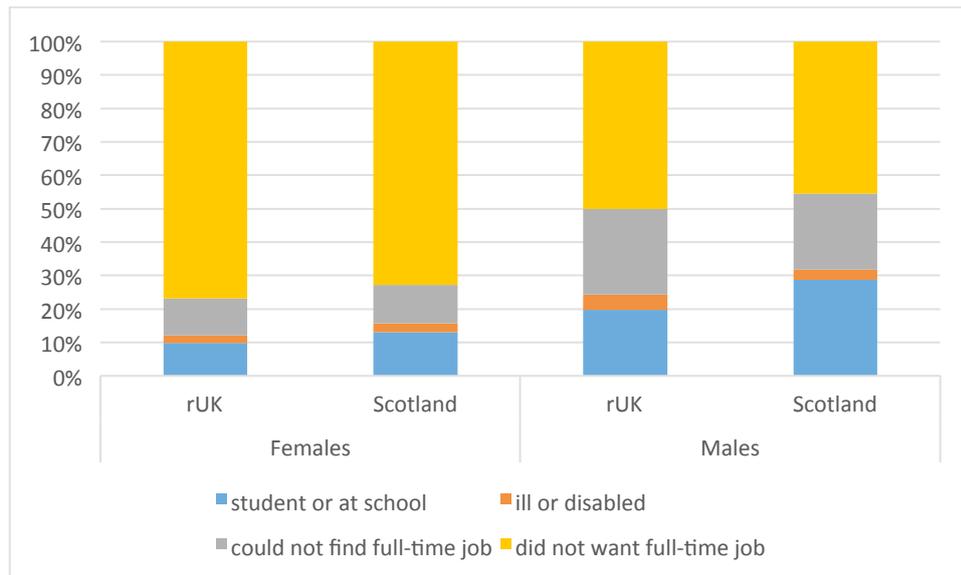
Figure 6: Part-Time and Full-Time Employment in Scotland 2015



Source: Labour Force Survey

Why do people work part-time? Is it their preference to work part-time, or would they prefer to work for more hours in a full-time job? The Labour Force Survey asks this question each quarter. Responses for males and females in Scotland and rUK are shown in Figure 7. The most common reason for working part-time is that part-time work is preferred. Most women, and around half of men, work part-time because they want to. Students, particularly males in Scotland, also find part-time working attractive and a small proportion of the part-time workers opt for this mode of working because they are ill or disabled. The main group who would prefer not to be working part-time are those who wish to have a full-time job, but were forced to work part-time because they could not find a full-time job. This reason for working part-time is more common among males than females.

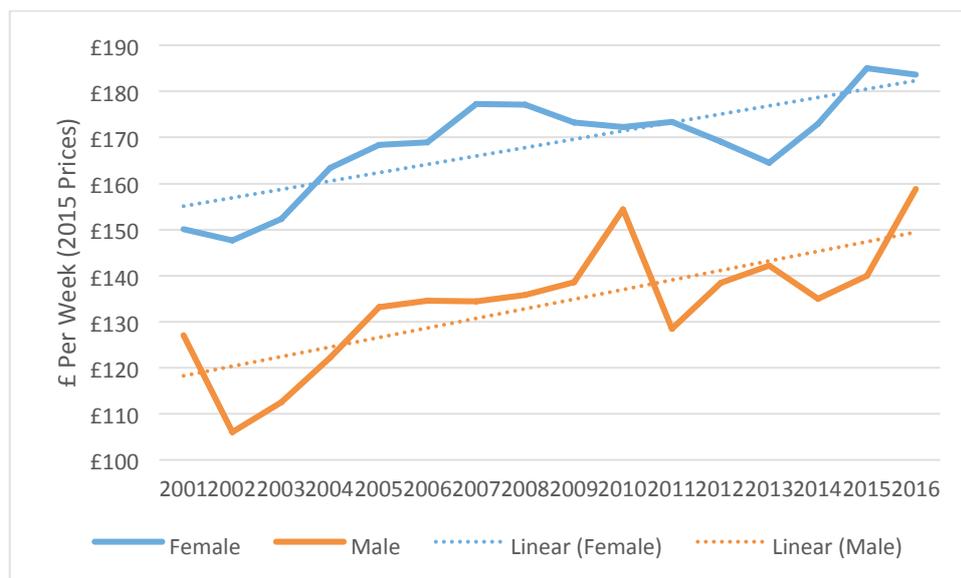
Figure 7: Reasons for Working Part-Time by Gender in Scotland and rUK 2015



Source: Labour Force Survey

Figure 8 presents a comparison of median gross weekly pay for men and women part-time employees in Scotland between 2001 and 2016. The direction of the pay gap for part-time workers is perhaps surprising, where the outcome is the reverse of that for full-timers. The real earnings of part-timers increased between 2001 and 2016, but the gap between male and female part-time earnings has remained largely constant

Figure 8: Real Median Gross Weekly Pay for Part-Time Workers in Scotland 2001-2016



Source: Labour Force Survey

From Figure 8 we see that part-time female workers earn more than male part-time workers, with the 2016 gender pay gap being 14% in favour of women. This may reflect differences in their characteristics, with female part-timers typically being better educated than male part-timers. Male part-timers may also be concentrated in a relatively small number of sectors/occupations (e.g. retail, hospitality) with possibly adverse consequences for their earnings. The reverse is the case for full-

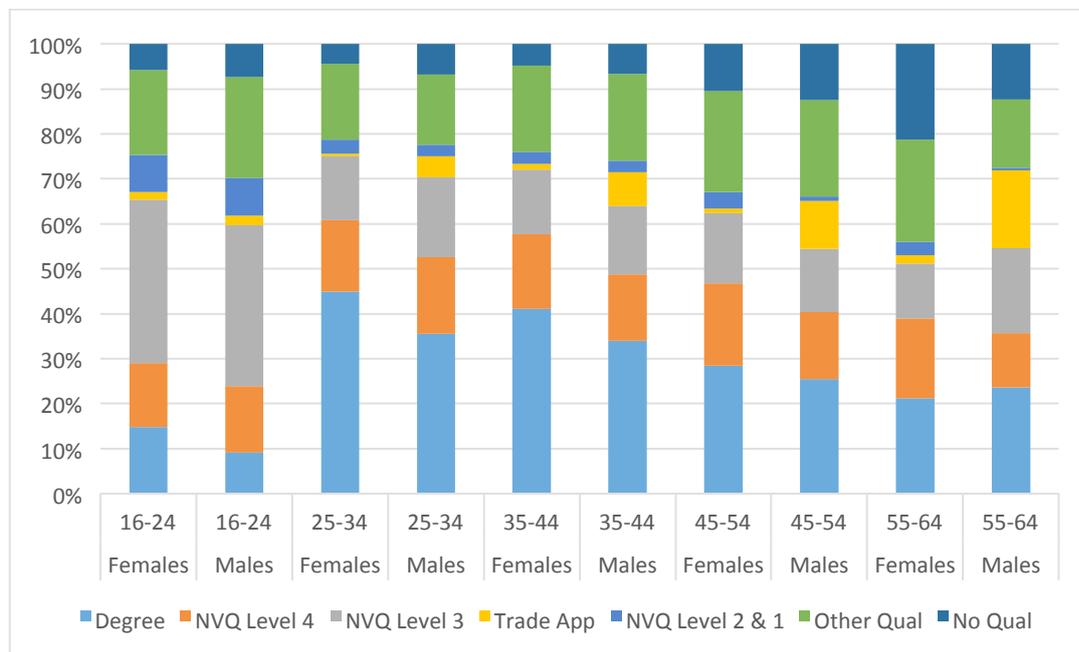
time workers where female employment is more concentrated than male employment. Employers may also not wish to commit to male part-timers who are searching for full-time opportunities. One possible consequence of female part-timers out-competing males, who must accept lower wages for part-time work, is that has led to an increase in earnings inequality among males.

3. SKILL DIFFERENCES – THE ROLE OF EDUCATION AND EXPERIENCE

Discussions of the gender pay gap for full-time workers typically focus on differences in the skills of male and female workers and on differences in the amount employers are prepared to pay for these skills. Discrimination results from employer’s being willing to differentially reward groups of workers who have the same skills. The groups may differ by gender, ethnicity, nationality etc. Skills are considered as those characteristics embodied in the individual which have an effect on his/her productivity. In this view skills are formed not only through formal education and training, but are also affected by experience, motivation, ambition etc. The Labour Force Survey collects detailed information on education levels and labour market experience, which allows analysis of the gender pay gap accounting for gender differences in these attributes.

Part-timers have fewer skills than full-time workers because, on average, they have less work experience and are less well-qualified⁵. Full timers are typically paid more than part-timers, and because more males than females work full-time, the overall gender pay gap favours males. But how much of that gap can be explained by differences in their characteristics, such as their experience and qualifications?

Figure 9: Educational Qualifications by Age Group, Scotland 2015.



Source: Labour Force Survey

Figure 9 shows data on the educational qualifications of employees by age in Scotland from the Labour Force Survey in 2015. For all age groups apart from the eldest (55-64), employed females have more educational qualifications than males. These patterns arise due to the closing education gap in attainment, which indeed reversed approximately 30 years ago. In addition, younger groups of female employees are better educated than older females and also have significantly higher

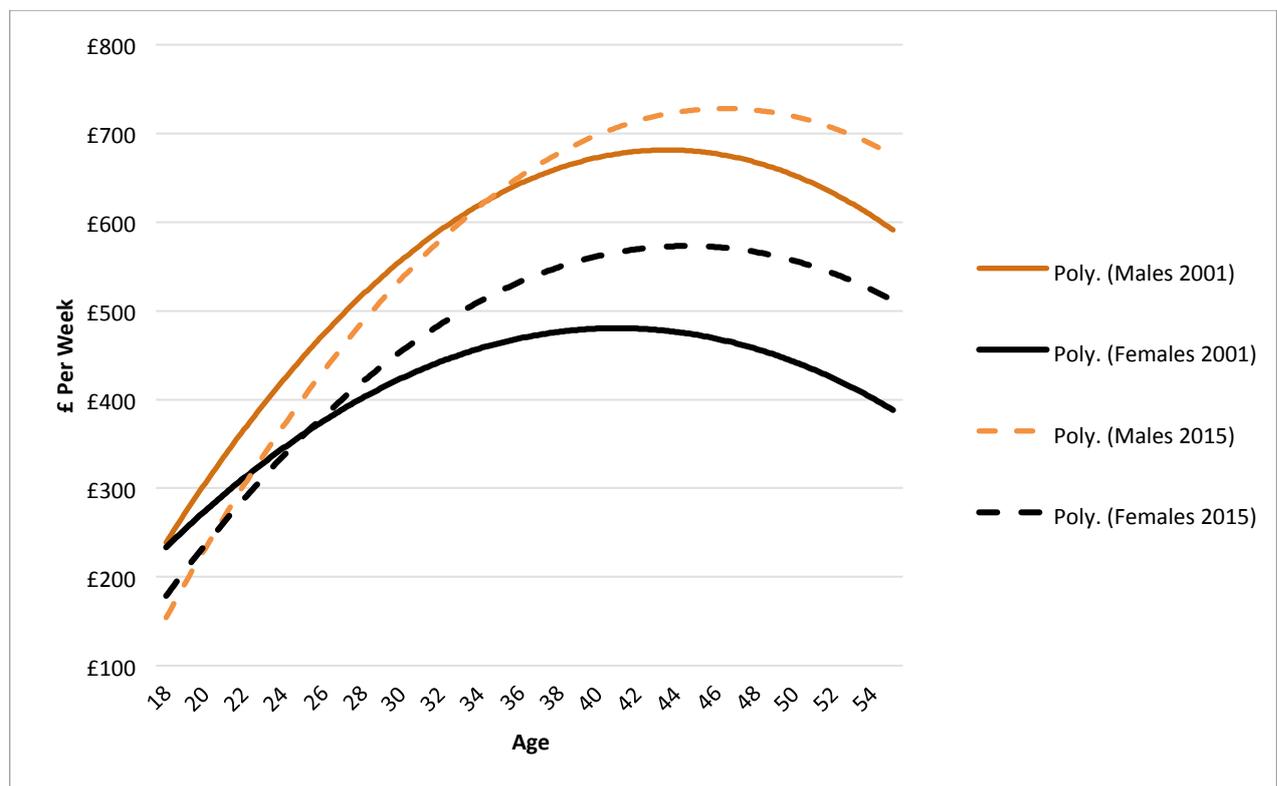
⁵ Hirsch, B. T. (2005). Why do part-time workers earn less? The role of worker and job skills. *ILR Review*, 58(4), 525-551.

educational achievement than males in the same age group. Thus, for example, among the age group 25-34, 60% of females either have a degree or NVQ level 4, while only 52% of males achieve this standard.

Given that higher levels of education command a premium in the labour market due to the associated higher levels of productivity, one would expect that the increasing gap between female and male levels of educational achievement will result in a further narrowing of the gender pay gap.

Changes in educational attainment and in labour market conditions help explain changes in the relationship between median earnings and age over time. Figure 10 shows estimated relationships between median real weekly earnings and age for male and female full-time workers in Scotland in 2001 and 2015. The age-earnings profiles show the typical pattern of a high rate of increase in wages immediately after labour market entry, which reflect large increases in productivity due to experience, but the return to experience increases at a decreasing rate during prime working age. In the latter period of age wages fall as skills begin to depreciate.

Figure 10: Age-earnings Profiles for Male and Female Full-time Workers, Scotland 2001 and 2015.



Source: Labour Force Survey

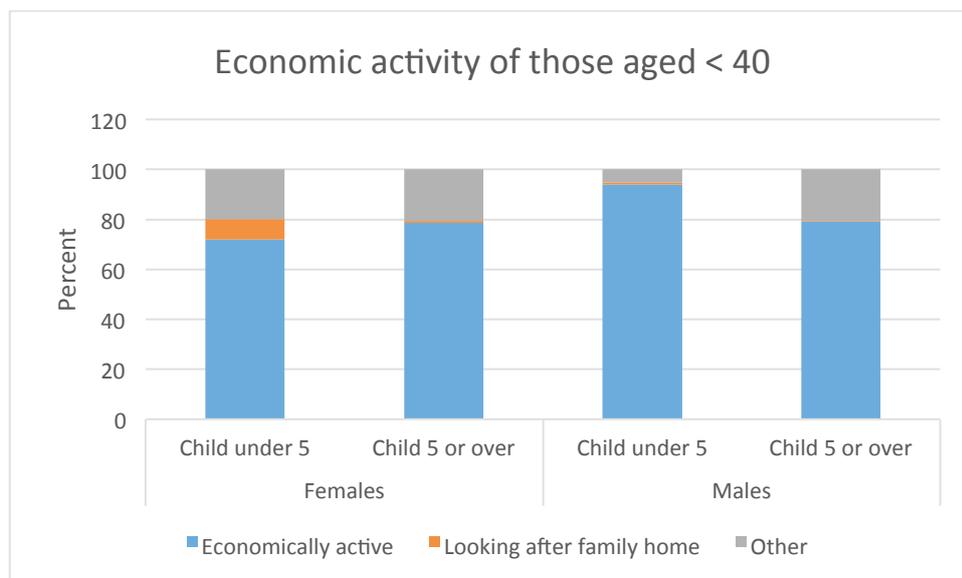
Figure 10 captures three important changes in the relationship between age and earnings for full-time workers that are likely to have influenced the gender pay gap in recent years. First, wages for younger males and females have both fallen relative to older workers. This may reflect growing returns to experience, or perhaps declining returns to education given that younger workers are now better educated than their older counterparts. Second, the gap between male and female earnings among the young has narrowed. Since the recession, young men are the group that have fared worst

in the UK labour market⁶. Third, in contrast to the experience of the young, real wages among older workers have increased, slightly faster among females than males, with peak earnings coming later in the working life.

A further noticeable feature of Figure 10 is the evolution of the gender pay gap with age. Examining the 2015 trend we see that at labour market entry and for a few years thereafter the gender pay gap is negligible, however then emerges at an increasing rate with age. By age 30, the pay difference has reached approximately 10%, widening to 20% by age 40. It is noticeable that the gender gap emerges and widens during the prime child-bearing ages. A recent Institute for Fiscal Studies Report on the Gender Wage Gap⁷ investigated the evolution of the wage gap in relation to childbearing. Using data from the British Household Panel Survey it shows that a wage gap of approximately 10% exists which is relatively constant over the 5 years prior to the arrival of the first child. The wage gap widens dramatically in the years after the birth of the first child, reaching 34% by the time the child is age 12 after which it persists at this level throughout adolescence.

Child-caring has different impacts by gender on whether an individual is economically active. Figure 11 compares economic activity rates for those with young and older children across genders. We see that the economic activity rate of parents with children of school age above is 80% for both men and women. In contrast, when there are young children in the household women are less attached to the labour market, with an economic activity rate of 70%, whereas the economic activity rate of men with young children is higher at 90%. These differences in economic activity rates imply different levels of labour market experience. As with education, higher levels of labour market experience command a wage premium because of the associated higher levels of productivity. Therefore a gender pay gap emerges as a result of differences in accumulated labour market experience.

Figure 11: Economic activity rates of those aged less than 40 by gender and children, Scotland 2015 and 2016.



Source: Labour Force Survey

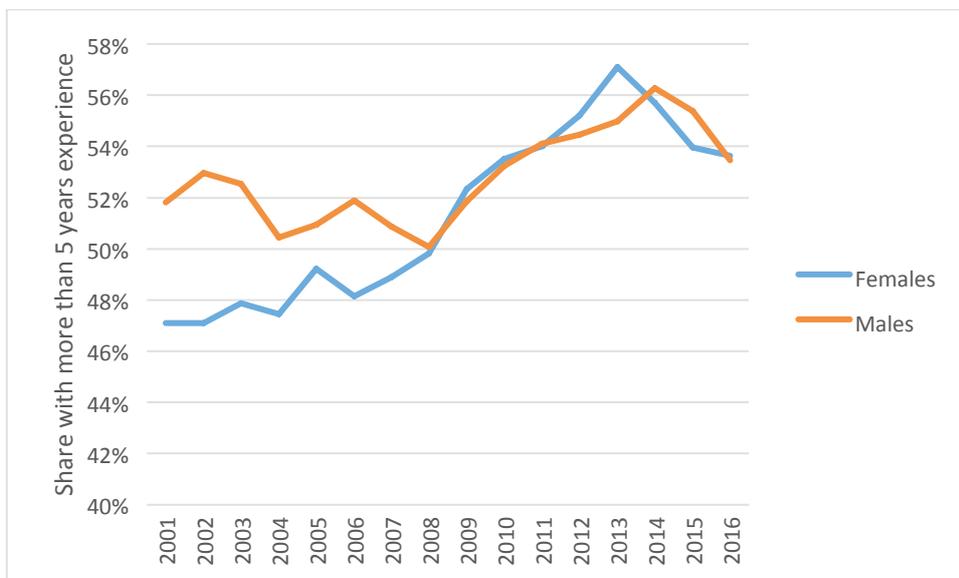
⁶ See for example: Tomlinson, N (2017) <http://www.resolutionfoundation.org/media/blog/no-country-for-young-men/>, Resolution Foundation

⁷ Costa-Dias, M., Elming, W., Joyce, R. (2016). The Gender Wage Gap. Institute of Fiscal Studies.

A related dimension of labour market experience is within-firm productivity, which is associated with the length of experience at an individual firm (i.e. firm tenure). A longer tenure is associated with a higher accumulation of firm-specific skills and productivity, and therefore workers with high tenures may receive higher wages reflecting their enhanced value to the firm. On the other hand workers with long tenures may be risk averse, willing to accept lower wage increments at their present firm as opposed to potential wage gains that could be made through “job-shopping”, i.e. moving jobs to obtain higher pay.

Figure 12 shows how the share of workers in Scotland with more than 5 years firm experience has changed between 2001 and 2016. For women this share increased annually between 2001 and 2013, indicating a tendency to remain with current firms longer. In contrast, for men in the early sample period this proportion was declining, suggesting higher labour market mobility. The trend reversed in 2008, coincident to the onset of the Great Recession. This increased tendency for workers to remain in the same job is likely to have occurred due to increased economic uncertainty and fewer labour market opportunities during the recession.

Figure 12: Proportion of workers with over 5 years firm tenure, Scotland 2001 – 2016.

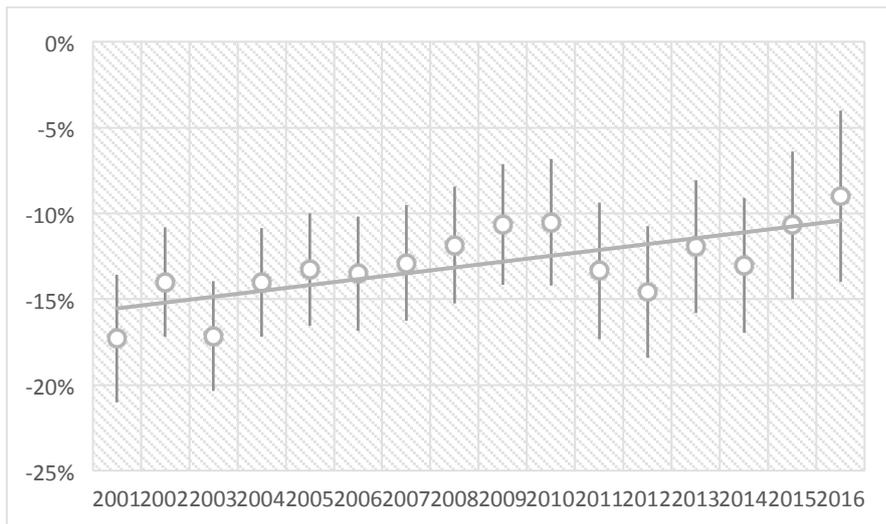


Source: Labour Force Survey

3.1 THE GENDER PAY GAP ADJUSTING FOR SKILL (EXPERIENCE AND EDUCATION) DIFFERENCES

If we control for the effects that differences in education and experience have on earnings, then any remaining difference - the unexplained component - might be interpreted as a measure of the underlying level of discrimination. This can be estimated from Labour Force Survey data using a technique known as the Oaxaca decomposition. In Figures 13a, 13b, and 13c we track the evolution of this unexplained component of the gender pay gap from 2001 to 2016 for all full-time workers, for workers aged under 35 and for those aged 35-55. These are shown with 95% confidence intervals and trend lines fitted to the estimates.

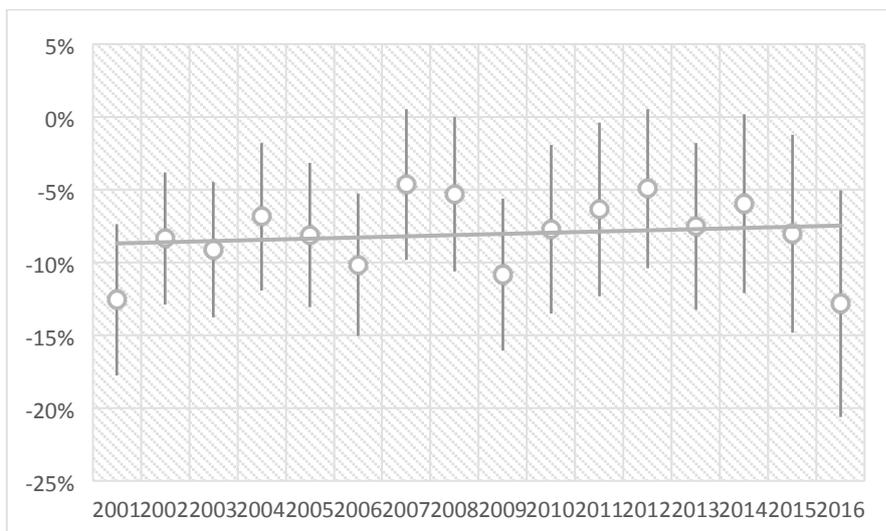
Figure 13a: Gender Wage Gap Corrected for Experience and Education, All full-time Employees



Source: Labour Force Survey

Results for all full-time employees show a gradual decline in the “unexplained” component of the gender pay gap (the gap corrected for experience and education) from around 15% to 10% between 2001 and 2016. Though this might reflect reductions in direct discrimination, it could also be the result of reduced barriers to entry into all-male occupations, which would be evidenced by female employment being less concentrated in a narrow group of occupations (discussed further below). Other possible explanations include increased in the relative importance of female representatives in labour organisations.

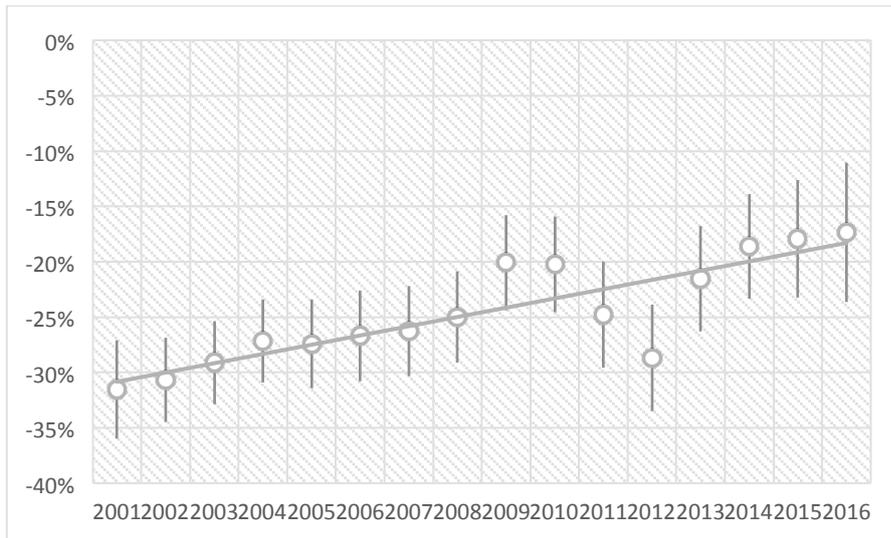
Figure 13b: Gender Wage Gap Corrected for Experience and Education, Full-Time Employees Aged under 35



Source: Labour Force Survey

Earlier (in Figure 10) we showed that the gender pay gap is much smaller amongst those aged less than 35. Figure 13b indicates that the unexplained component of the gender pay gap is likewise smaller in this group, around 7.5% in 2016. Furthermore, it has changed only by a relatively small amount between 2001 and 2016.

Figure 13c: Gender Wage Gap Corrected for Experience and Education, Full-Time Employees Aged 35 to 55



Source: Labour Force Survey

Figure 13c displays the unexplained component of the gender pay gap for those aged 35-55. For this age group, both the gender pay gap as a whole, as well as its unexplained component, is larger than for younger workers. In contrast to the younger age group, the unexplained component of those aged 35 to 55 has changed significantly over time, declining from over 30% in 2001 to around 18% in 2016. Male employment conditions were more adversely affected than those of females at the beginning of the financial crisis in 2008. This may explain the fall in the pay gap in 2009 and 2010. However, males benefited more at the start of the recovery.

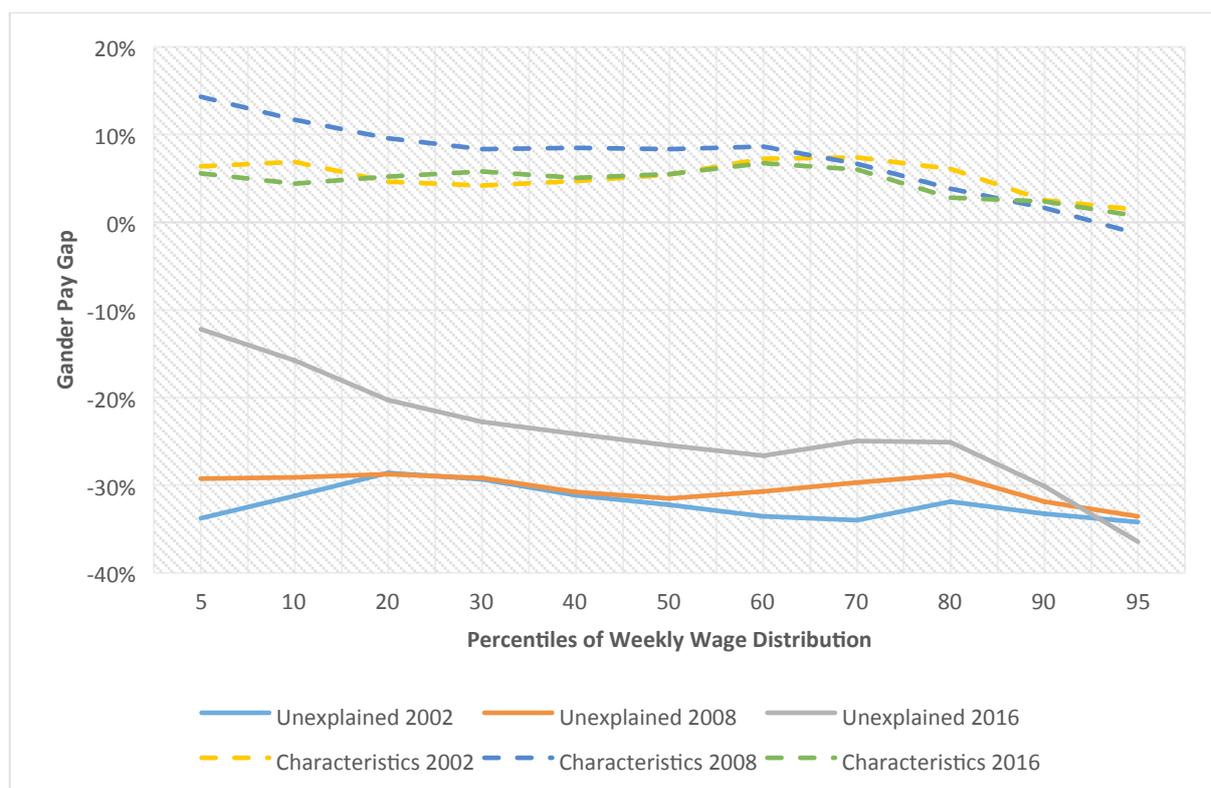
These analyses try to explain differences in men’s and women’s average or median pay into one part that can be “explained” by observable characteristics such as education or experience, and another part which remains unexplained and which may result from some form of discrimination. However, an analysis which focuses on the gender gap at mean or median pay provides no information on whether observable characteristics have a different effect in other parts of the pay distribution. One could examine whether education and experience have different effects on the pay of low-wage workers compared with those at mean earnings. Although it requires a more sophisticated analysis⁸, it is possible to identify such effects at different points within the pay distribution. Results are shown in Figure 14. These are based on an analysis of weekly earnings for full-time workers in 2002, 2008 and 2016. These years cover the pre- and post-recession periods, as well as the year in which the recession began – 2008.

The results show how the gender pay gap is explained at the lower, middle and upper ends of the earnings distribution by differences in individual characteristics – education and experience – and how much by unexplained factors that might include discrimination. Thus, the horizontal axis of Figure 14 measures percentiles of the hourly wage distribution from the 5th (only 5% of workers earn less) to the 95th (95% of workers earn less). The vertical axis measures the effect on female wages. Thus, the unexplained component of the gender pay gap typically has a more negative effect on female pay than does their characteristics. There has been a change in the lower tail of the

⁸ See: Victor Chernozhukov, Ivan Fernandez-Val and Blaise Melly (2008): Inference on cdeco distributions. MIT Department of Economics Working Paper No. 08-16.

distribution through time: between 2008 and 2016 there has been a marked reduction in the unexplained component of the gap. Factors such as the minimum wage which mandates equality at the lower end of the distribution may have contributed to this. Note also that women’s characteristics have a positive effect on the wage gap at the lower weekly pay rates, since they are typically better qualified and/or have more experience than low-paid males. However, at the upper end of the earnings distribution, there was little change between 2002 and 2016 in both the “unexplained” component of the gender pay gap *and* in the contribution of differences in characteristics to the pay gap. Recall that we observed a reduction in the gender pay gap between 2001 and 2016 when measured at the median wage (as shown in Figures 13a-13c). This distributional analysis shows that this improvement has been driven by relative improvements in the weekly pay of lower paid female workers. For better paid females, the distributional analysis shows no significant reduction in the gender pay gap over the period.

Figure 14: Explained and unexplained components of the Gender Wage Gap



Source: Labour Force Survey

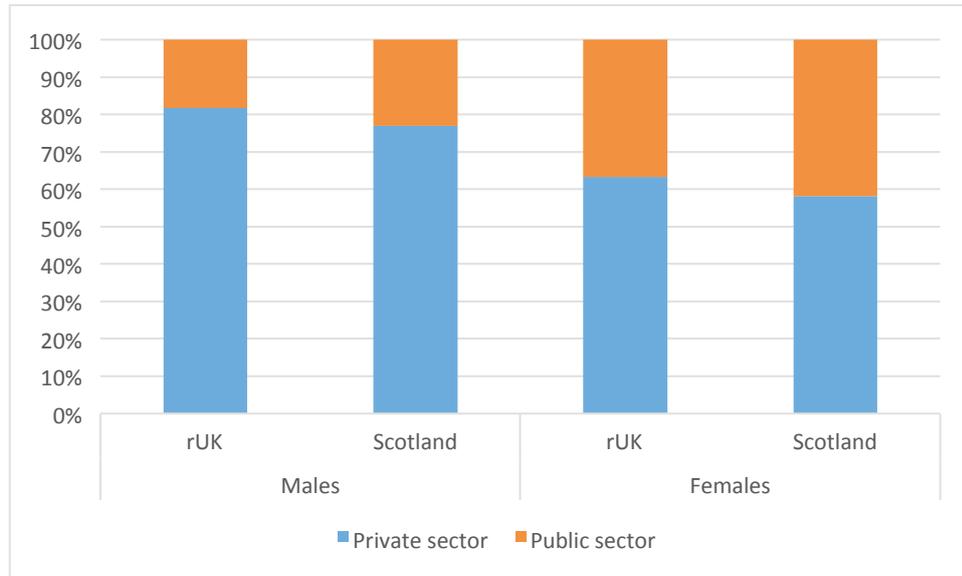
4. OCCUPATIONAL POLARISATION OF EMPLOYMENT

Gregory and Connolly (2008)⁹ argue that occupational polarisation is a contributory cause of the gender pay gap. The UK labour market has been characterised by a distinction between “women’s jobs” and “men’s jobs”; this distinction may arise through a number of channels: differences in the type of job/sector within which the employee works; job-specific skill differences; different preferences over non-labour market activities which may influence the type of job taken. One obvious measure of concentration of jobs by gender is the share of female employment in public sector employment. As shown in Figure 15, a larger proportion of women’s employment is in the

⁹ Gregory, M., & Connolly, S. (2008). The Price of Reconciliation: Part-Time Work, Families and Women's Satisfaction. *The Economic Journal*, 118(526), F1-F7.

public sector – 42% vs 23% in Scotland, which is slightly higher than in rUK (37% vs 18%). Given that public sector wages tend to be higher than in the private sector, gender pay differences will be partially offset by the sectoral wage differential.

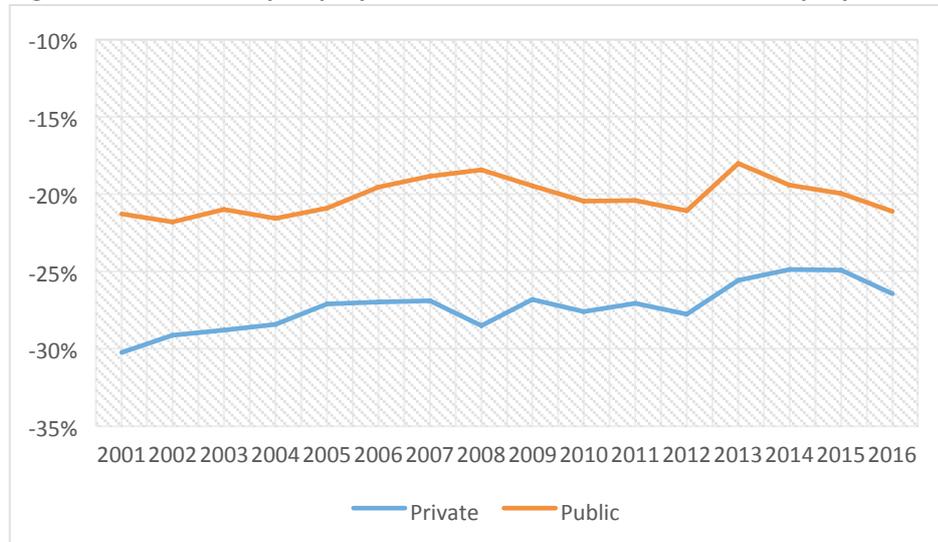
Figure 15: Private and public sector employment by gender, Scotland 2015.



Source: Labour Force Survey

Focussing on gender pay gaps within each sector, see Figure 16, we see the wage gap in the public sector is systematically lower than in the private sector. This is consistent with the finding of Rowthorn (1992)¹⁰ that wage gaps are lower when pay setting is centralised. Over time the public sector gender wage gap despite small fluctuations has remained fairly constant, with an observed gap of 18% in both 2001 and 2016. In contrast the private sector has seen a decrease in the pay gap from 30% in 2001 to 25% in 2016.

Figure 16: Gender Pay Gap by Public/Private Sector, full-time employees, Scotland

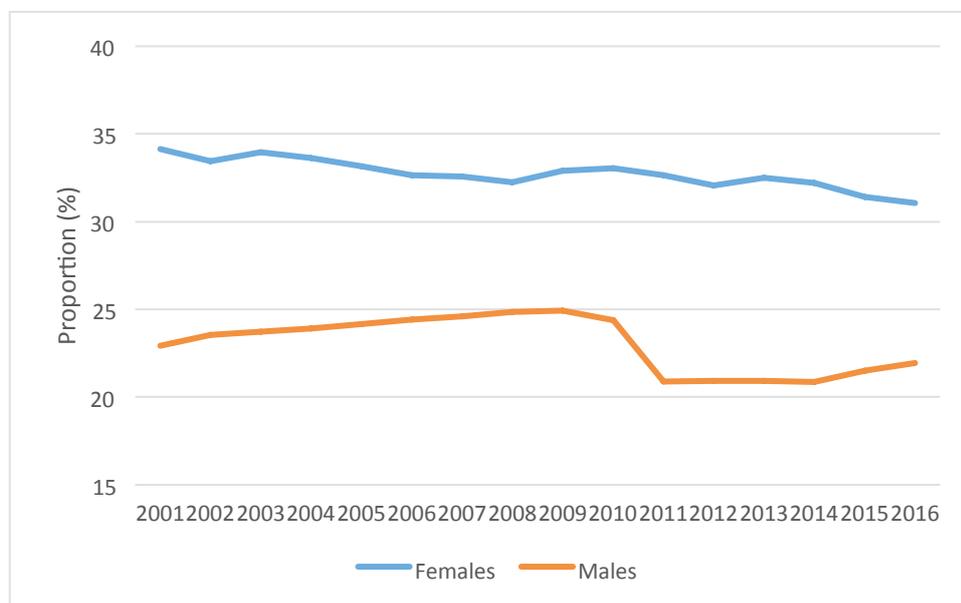


Source: Labour Force Survey

¹⁰ Rowthorn, R.E. (1992). Centralisation, Employment and Wage Dispersion. *The Economic Journal*, 102(412), 506-523.

Why would men and women prefer different types of jobs? Lordan and Pischke (2016)¹¹ show that women report less job satisfaction when they work in male dominated jobs or sectors, and are more likely to leave occupations with a higher share of males. Figure 17 shows the evolution of the proportion employed in the five largest occupations by gender. Since 2001 for women this has shown a subtle, but steady decline. Whereas for men the proportion showed a slight annual increase up to 2010, followed by a sharp decline in 2011, and has remained approximately constant since.

Figure 17: Proportion of Employment in Five Largest Occupations



Source: Labour Force Survey

Job differences may also be a consequence of different skills. Although over the past few decades gender differences in education attainment have reversed, such that nowadays at labour market entry women have higher rates of academic qualifications, gender differences in subject choice persist. In schools girls are more likely to choose subjects in the arts and social sciences, and boys science and technology¹², as a consequence subject choice in higher education is highly gender segregated, with 71% of STEM graduates being male¹³.

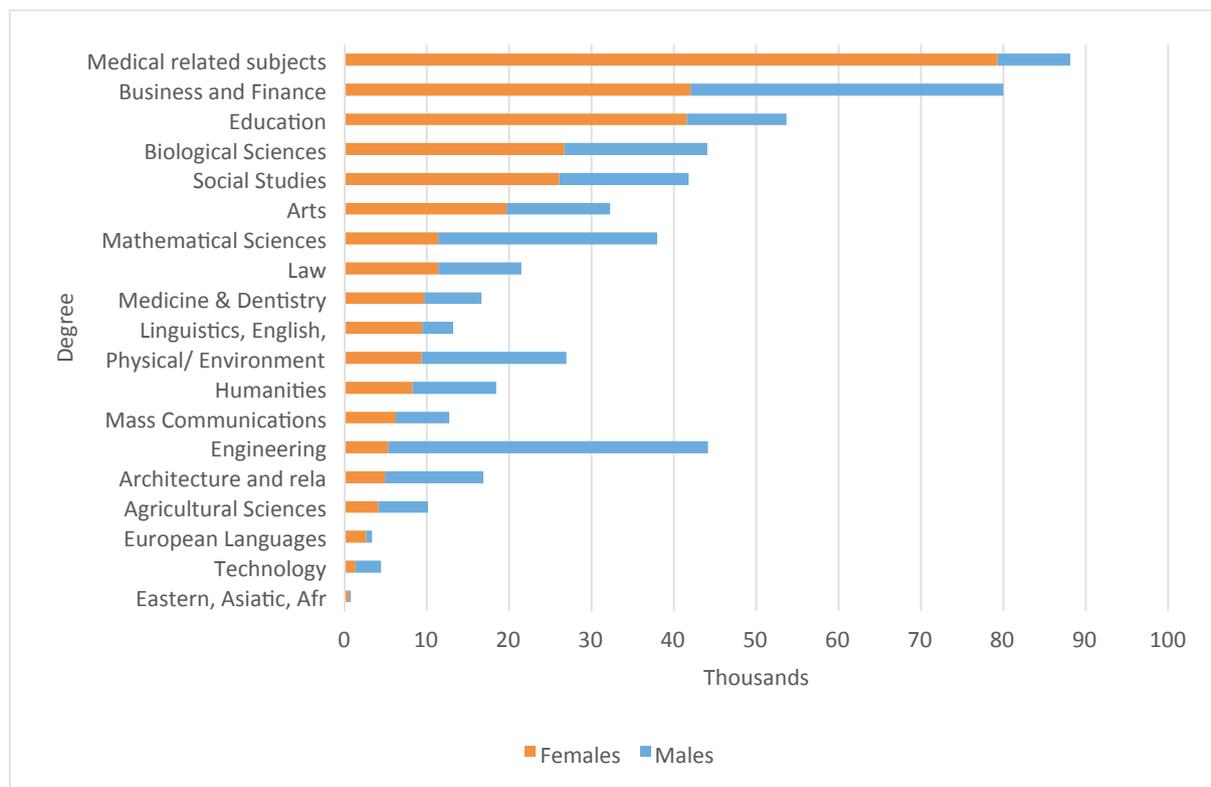
The Labour Force Survey collects information on the subject studied for those individuals who have a university degree. This allows an analysis of employment and wage differences according to subject. Figure 18 reports the number of individuals in the survey according to degree subject. There is approximate equal gender representation in only four subject areas: Business and Finance, Law, Medicine and Mass Communications. Males dominate in mainly technological subject areas: Mathematical Sciences, Physical/Environmental Sciences, Architecture, Agriculture and related Sciences, Engineering and Technology. In all other subject areas females dominate, most notably in the Medical related subjects (which includes nursing), Education, Biological Sciences and Arts related subjects. The preponderance of girls studying ‘female-friendly’ subjects may lead to the selection of females into “women’s jobs”, which command a lower labour market remuneration.

¹¹ Lordan, G. and Pischke, J. (2016). Does Rosie Like Riveting? Male and Female Occupational Choices. *National Bureau of Economic Research (NBER)*

¹² Scottish Government Equality Outcomes: Gender Evidence Review (2013)

¹³ Science and Engineering Education Advisory Group (2012). Supporting Scotland’s STEM education and Culture.

Figure 18: Numbers of working individuals by degree subject and gender, Scotland 2015



Source: Labour Force Survey (2012-2016)

Occupational polarisation also arises due to different preferences over the geographic location of work. In a 2004 survey of the economically inactive in Wales, Latreille et al (2006)¹⁴ find that unemployed and inactive men are prepared to travel around 35% further to work. This is consistent with studies which show that women on average have shorter commuting times than men. These geographical differences may be partly attributed to labour market opportunities: a greater tendency for women tend to work in sectors which are more geographically dispersed, such as the service sector, implies that it is easier for them to find work closer to home. However the main factor appears to be family circumstances, with women choosing to work closer to home due to childcare commitments.

5. THE GENDER PAY GAP AND ECONOMIC GROWTH

Is there a link between lower gender pay gaps and faster economic growth? At one level, it seems obvious that pay discrimination is harmful to economic performance. If individuals are not allocated to the tasks to which they are best suited and paid appropriately, then economic growth will suffer. This argument might be true so long as GDP provided an accurate measure of output. However, as mentioned in the introduction, GDP as currently measured, fails to adequately capture activity in households, a point frequently made by feminist economists.

However, even using the current measure of GDP, isolating the effect of reductions in the gender pay gap on GDP growth is problematic. This is largely because there are many other influences on economic growth which perhaps overwhelm the effect of reducing the differential between men and women's pay. Thus, for example, Figure 19 below shows annual GDP growth rates for the UK along

¹⁴ Latreille, P.L., Blackaby, D.H., Murphy, P.D., O'Leary, N.C., Sloane, P.J. (2006). How Far and For How Much? Evidence on Wages and Potential Travel-to-Work Distances from a Survey of the Economically Inactive.

with the size of the gender pay gap as measured by the OECD over the period 1980-2015. There is clearly no strong relationship suggesting that reductions in the pay gap are associated with faster GDP growth. This is confirmed by a statistical analysis of all OECD countries¹⁵. For the UK, Figure 19 seems to indicate that a large gender pay gap was associated with the 1980s and early 1990s when GDP growth rates were volatile. During this century, the gender pay gap has been falling, but so too have annual growth rates.

Figure 19: GDP Growth Rates and the Gender Pay Gap in the UK 1980-2015



Source: OECD

This is a relatively simple analysis. It does not preclude a more detailed analysis of the factors driving economic growth showing a link between the gender pay gap and GDP growth, but it does suggest that a reduction in the pay gap is not obviously a primary cause of such growth. For some developing countries, it has been argued that increases in low-wage female employment have helped stimulate growth by encouraging investment. Possible examples are Bangladesh and Vietnam, where expansion of textile sector, which predominantly employs females, have made a substantial contribution to growth. Our analysis does not quantify the effects on Scottish GDP of increased female labour market participation that might follow if wage offers to females were increased (so narrowing the gender wage gap).

These arguments suggest that assessing the causal linkages between the gender pay gap and economic growth is difficult. At different times, GDP growth is driven by different sectors in the economy. For example, in the early part of this century, financial services played an important role in

¹⁵ Based on a fixed effects model for all OECD countries for the period 1970-2015. Results available from the authors on request.

driving UK economic growth. If these sectors predominantly employ males, then economic growth will increase the gender pay gap. In contrast, if growth is concentrated in sectors that predominantly employ females, the gender pay gap is likely to contract. Again, it is difficult to assign causality between economic growth and the gender pay gap. Improvements in the allocation of labour due to the elimination of discrimination may increase economic growth. But equally, economic growth may lead to changes in the gender pay gap.

6. CONCLUSION AND POLICY DISCUSSION

In this paper we have documented the recent history of gender pay differences in Scotland. A comparison of median gross weekly pay across all workers reveals that the pay difference between men and women in Scotland was approximately 30% in 2016. However, women are more likely to work fewer hours, i.e. be in part-time employment. Therefore, differences in the weekly wage do not reveal whether the difference is due to number of hours worked or due to women being paid a lower wage for comparable work undertaken by men. We therefore compare the pay of full-time workers and part-time workers separately. Our analysis reveals a lower gender pay gap of 18% for full-time workers, and for part-time workers, a pay gap in favour of women (i.e. women are paid more than men) of 14%.

International measures of the gender pay gap concentrate on differences between the pay of female and male *full-time* workers. We show that the gender pay gap for full-time workers in Scotland has narrowed over time, with the recent decline driven by a larger decrease in real wages for men relative to women. For young workers at labour market entry, the gender pay gap is marginal, but increases to 10% within a decade and to 20% for full-time workers by age 40. The largest increases in the gender pay gap occur during the prime child-bearing ages.

Typical explanations of the existence of the gender pay gap have highlighted that a proportion of the gap can be attributed to differences in the levels of skills, as measured by education and experience, between men and women. After correcting for these influences the “unexplained” component of the gender pay gap, which may reflect direct discrimination on the part of employers has been falling, and is currently around 10%.

Another key contributor to the gender pay gap is occupational polarisation, where certain occupations tend to employ vastly more women than men, or vice versa. Occupational polarisation may occur due to various factors. Men and women may simply prefer different types of jobs or the location of where they work. Job choice somewhat reflects prior training and skill acquisition, and therefore systematic differences between genders in subjects studied during formal education will result in systematic differences in employment choices.

Different policies have been put in place over time, both within the UK and internationally, to address pay equality. We conclude with a discussion of the issues highlighted in this paper and their relation to the types of policy measures that have been implemented. When thinking of the gender pay inequality, a potential aim is to secure “equal pay for equal work”. This idea implies two dimensions to guide the formation of policy: 1) is the work undertaken by men and women “equal” – i.e. requiring similar skills, experience etc.; 2) are those skills, experience etc. remunerated equally across genders. Broadly we can categorise different types of policy areas:

- a) Policies that seek to address level differences between men and women in characteristics which influence wages, such as education and experience.
- b) Policies that seek to address gender differences in the monetary returns to characteristics which influence wages.

- c) Policies addressing gender disparities in employment across sectors, occupations and within firms.

The first two areas involve actions which are within the remit of the Scottish Government, and could involve policies which address skill acquisition, access to labour markets, the structure of public sector employment and the availability of and access to adequate childcare arrangements. As employment and corporate law is controlled by the UK Government, there is less scope for Scottish Government action. One salient aspect is that organised labour does not necessarily recognise the border; both sides of the labour market (firms and workers) can easily compare conditions in Scotland with the more dominant labour market in the rest of the UK. Labour market mobility will tend to narrow wage differentials between Scotland and the rest of the UK, which in turn will influence the gender pay gap.

6.1 ADDRESSING DIFFERENCES IN SKILL CHARACTERISTICS WHICH INFLUENCE WAGES

The education gap (in attainment) closed/reversed approximately 30 years ago, and has been accompanied by a narrowing of the gender wage gap. As depicted in Figure 9, for workers aged 50 or younger female education attainment is equal to, or exceeds that of men, whereas for older workers an education gap exists. Over the next 10-20 years there will be a further closing of the education attainment gap, as older cohorts where men's educational attainment exceed that of women are replaced with younger cohorts where the reverse is true. This implies that further improvements to the gender gap will manifest over time along this dimension without the need for policy measures.

However, although the education gap in attainment has closed, differences in subject choice persist (as shown in Figure 18): girls are less likely to study science-based subjects. The gender balance in subject choice has been largely stable over the past three decades. Although participation in STEM Highers is roughly equal, looking within subjects we see large imbalances with girls less likely to study Physics, Computing and Technology Studies, and more likely to take Biology and Human Biology. This subject polarisation persists at university level, with the latest from the Higher Education Statistics Authority (HESA)¹⁶ indicating that the share of male students taking physics is 60%, in maths 63%, in computing 83% and in engineering 84%.

Many programs have been initiated to address the gender imbalance in subject choice, including school-based programs at both primary and secondary levels, as well as university and college outreach programs. The efficacy of these programs may improve via an integrated approach across educational institutions rather than individualised programs at each education level. Advice given to students regarding their choice of subjects which includes discussion of employment pathways and pay prospects may encourage improvements in the gender balance within facilitating subjects, which are a pre-requisite for university degree courses. It should be recognised that the impact of interventions aimed at changing the composition of employment will only be manifest in the long-run, rather than within an electoral cycle. Nevertheless, it is vital that these programs are subject to ongoing evaluation to reduce gender disparities is achieved over time.

To address gender differences in labour market experience, it is important to recognise that the burden of childcare duties fall on women. Policies that actively encourage flexible working hours, the sharing of childcare responsibilities (e.g. parental leave vs maternity leave), improvements in childcare availability and/or quality may help facilitate the transition back to full-time employment after childbearing.

¹⁶ Available from www.hesa.ac.uk

6.2 ADDRESSING DIFFERENCES IN MONETARY RETURNS TO SKILL CHARACTERISTICS

Differences in rewards to skills (the unexplained component) are difficult to measure. However, these seem to drive a gender pay gap which increases with age. Figure 10 showed that on labour market entry, the pay gap is marginal, but increases to approximately 10% within a decade.

Differences in advancement within the firm may partly explain why the gap increases with age. This will not be captured by the “average pay gap”. A requirement to measure both the pay gap and male/female pay ratios at *different* points in the career ladder (entry, mid-level management, upper-level management) would have the advantage of highlighting the pay gap between men and women at different stages of career development, and provide an indication of whether the average pay gap within a firm is driven by a tendency for women to progress up the career ladder at a slower rate than men.

6.3 ADDRESSING GENDER DISPARITIES IN EMPLOYMENT ACROSS SECTORS, OCCUPATIONS AND WITHIN FIRMS.

Recent UK legislation to address the gender pay gap has been introduced. The Equality Act 2010 (Gender Pay Gap Information) Regulations 2017 requires that from April 2018 large firms (over 250 employees) have to report the following information:

1. Gender pay gap at the mean and median
2. Gender pay gap in bonus pay at the mean and median
3. The ratio of the proportion of males receiving a bonus payment and proportion of females receiving a bonus payment
4. The proportion of males and females when divided into four groups ordered from lowest to highest pay.

The UK is not alone in an international context in requiring firms to monitor gender differences. In 2003 Norway mandated that at least 40% of corporate boards be made up of women. Finland, France, Germany, Iceland, Italy, Spain and the Netherlands have all passed similar reforms. The evidence of the effectiveness of the quota in Norway is not overwhelming. Although representation was significantly increased, there is no evidence that gains were seen at lower points in the earnings distribution, nor an increase in enrolment in business programs by females, nor a convergence in the earnings trajectories of graduates of business programs¹⁷.

On International Women’s Day 2017 (8th March 2017) Iceland announced that by 2020 every company with at least 25 employees would be mandated to demonstrate pay equality. Switzerland has a similar, albeit voluntary scheme. Although an impressive aspiration, without addressing the underlying causes of the gender pay gap as discussed in this paper, such programs may find their objectives challenging to achieve.

Our analysis perhaps suggests that the minimum wage has had an influence in closing the gender pay gap at the lower end of the income distribution. The Treasury estimated that 65 per cent of those benefitting from the introduction of the National Living Wage in 2016 would be women. Women are also likely to benefit from the Scottish Business Pledge, though it less clear that this will have a substantial effect on the gender pay gap, given that pay differentials at the lower end of the pay distribution are already relatively small. Given that the National Living Wage is mandatory, while

¹⁷ Bertrand, M., Black, S.E., Jensen, S., Lleras-Muney, A. (2014). Breaking the Glass Ceiling? The Effect of Board Quotas in Female Labor Market Outcomes in Norway. *National Bureau of Economic Research (NBER)*

the Scottish Business Pledge is voluntary the effect of the latter on the pay gap will also be affected by the gender composition of workers in the firms signing up to the pledge.

Closing the pay gap may also have a role in Scotland's "prevention" agenda. Higher pay for women with children may play an important role in the children's welfare. In addition, it may reduce the likelihood of poverty and dependence in later life since higher pay increases the opportunity to increase wealth in pensions, housing etc.

Finally, it is worth noting that employers cannot dictate who applies for posts, whether these be internally or externally advertised. Similarly, individuals can only be advised as to the opportunities opened and closed by the choices that they make while seeking to acquire skills that may be valued in the labour market. Compulsion does not usually aid labour market efficiency. Reduced efficiency is likely to inhibit sustainable economic growth. However, there are cases where the evidence against compulsion is relatively weak, minimum wages set at reasonable rates being one example.

There is a case for policy intervention where individuals and employers are poorly informed about the implications of choices that they make over school, college or university subjects or about how to enhance and develop their skills over their lifetime. Employers are not always fully informed when they make hiring and advancement decisions and may be influenced by individual attributes (such as gender) that are not related to productivity. The Scottish Government is using through the Scottish Business Pledge to persuade employers to pay the living wage. Similarly moral suasion can be used to exert downward pressure on the gender pay gap. Such policies are available to the Scottish Government since they do not require legislation. Our argument is that these should be directed towards aiding women around their child-bearing years and at the upper end of the wage spectrum if the intention is to ensure a significant further reduction in Scotland's pay gap.