

Even money? Trends in earnings and income inequalities in Scotland and the UK, 1997-2016

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Executive summary

Income inequality is a well-established ‘fundamental cause’ of health inequality. Given that earnings are an important component of income, the aim of this work was to explore trends in inequalities in earnings (as well as in overall household income) within Scotland and other parts of the UK over the last two decades. This was done by means of analyses of the UK’s Office for National Statistics (ONS)’s Annual Survey of Hours and Earnings (ASHE), a 1% sample of all employee jobs taken from HM Revenue and Customs ‘Pay As You Earn’ (PAYE) records. Analyses were undertaken for the four UK nations, as well as eleven large UK cities. These were supplemented by additional analyses of household income derived from the Scottish Household Survey.

The analyses highlighted a number of important issues:

Overall trends in inequalities

- Absolute inequalities in earnings widened considerably in Scotland, and in other parts of the UK, between 1997 and 2016. Relative inequalities widened until around 2011, but then decreased to levels similar to those in observed 1997. However, there were differences between the scale of, and trends in, inequalities in earnings from *full-time* (lower and fairly static) and *part-time* employment (higher and increasing).
- Trends in overall household income (for a shorter period: 1999/2000-2016) followed a broadly similar pattern to that of full-time earnings: increasing absolute inequalities, and little change in relative inequalities.
- The narrowing of earnings inequalities in the later period of analysis was influenced by the recession and the decrease in the value of earnings in real terms among the highest paid after 2008. However, independent forecasts suggest income inequality is set to widen again in the next few years across the UK.

Earnings and inequalities in the public and private sectors

- In Scotland around one third of all employee jobs, and 40% of all female employee jobs, are in the public sector. These figures are higher than in England, and they emphasise the importance of the public sector to any attempts to narrow economic inequalities in Scottish society.
- There has been some progress in this regard: in the public sector (but *not* in the private sector), increases in earnings among the lowest paid between 1997 and 2016 exceeded (proportionally) increases among the highest paid. As a result, relative inequalities in earnings in the public sector decreased over time, in contrast to the private sector where they increased (particularly for part-time employment). In addition, the lowest paid jobs in the public sector are now generally better remunerated than the lowest paid in the private sector.
- Median earnings in the public sector are also higher than in the private sector, particularly for part-time employment. This gap has widened over time, with the private sector having been much more affected by the decrease in earnings in real terms following the recession.

- Differences in public sector earnings between Scotland and England were also observed: among lower-paid *full-time* employees, increases in earnings over the period of analysis were notably greater in Scotland than in England; increases for the lowest paid *part-time* employees were also slightly higher in Scotland.

Low pay and gender inequality

- The scale of low paid employment is considerable. In 2016, half a million jobs in Scotland – 20% of all employee jobs, and almost 40% of part-time jobs – were paid below the level of the ‘real’ living wage (RLW). Approximately 65,000 of those jobs were in Glasgow. The figures had improved slightly by 2017 (and to a greater extent in some parts of Scotland) but remained high.
- The lowest paid jobs are predominantly held by women. Approximately two thirds of jobs paid below the RLW, and two thirds of jobs paid below minimum wage levels (i.e. including UK Government’s defined ‘national living wage’), are held by women.
- Men continue to be paid more than women on average. However, the size of the overall gender gap in earnings varies considerably depending on the choice of statistical measure employed. In 2016, *full-time weekly* earnings in Scotland for men were almost 20% higher than for women. However, the gap has reduced considerably since 1997 (when male full-time earnings were 38% higher in Scotland), with decreases seen across all occupation groupings.
- In Scotland, reductions in the gap in earnings between men and women have been observed in both the public and private sectors. However, a much larger gap remains in the private sector. In addition, the reduction in the earnings gender gap in the public sector has been greater in Scotland than in England.

Income inequalities in Scotland have widened considerably since the late 1970s. The more recent trends presented in this report show that there has been no real narrowing of the gap in the last 20 years: this is true of both household income inequalities, and also earnings inequalities – the main focus of this report. With income inequalities predicted to widen further in the years ahead, health inequalities in Scotland are also likely to widen unless there is a concerted political effort to address the issue. One of the stated aims of the Scottish Government is to narrow health inequalities: to do this they will need to employ all available economic powers to narrow socioeconomic inequalities in the country. This could include a variety of approaches. For example, with power over public sector pay, the Scottish Government has the ability to directly redistribute paid income among a very sizeable section of Scottish society. Their current approach (as recently implemented as part of the NHS pay agreement) of freezing senior pay and increasing pay at lower levels could be expanded to reducing the pay of the highest earners in order to increase that of the least well paid. More broadly, previous recommendations aimed at narrowing income inequalities in Scotland highlighted a range of policy options that were available with existing and recently devolved powers¹. These include increasing total income tax take and making it more progressive, using all available power to support reduced inequality in capital ownership (i.e. housing, companies, land, etc.), new measures of wealth and asset taxation, and a variety of actions to address poverty. These could be implemented

alongside additional learning from the approaches of other countries with narrower earnings (and income) inequalities.

Acknowledgements

Grateful thanks are due to a number of people who have helped with this report.

First, we would like to thank staff in the Annual Survey of Hours and Earnings (ASHE) section of the UK Office for National Statistics (ONS) for the provision of earnings data, and for responding to a large number of queries and annoying emails: particular thanks to Katie Healey and Llio Owen in that regard. Similarly, we are grateful to Maike Waldmann and Andrew White at the Scottish Government for the provision of household income analyses from the Scottish Household Survey, and for related advice.

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Finally, the usual thanks are due to Joe Crossland in GCPH for his invaluable assistance in publishing the report.

Background, aims and research questions

Scotland's poor health relative to elsewhere in Western Europe is well documented^{2,3}. Much of this is explained by the scale of *inequalities* in health: socioeconomic inequalities in health are the widest in Western Europe, and these therefore impact on overall levels of population health, as measured by indicators such as life expectancy and mortality rates⁵⁻⁷. Improving overall levels of health in Scotland, therefore, is to a large degree dependent on narrowing *inequalities* in health across the population.

The underlying causes of health inequalities are also well known. These 'fundamental causes' are societal inequalities in income, wealth and power⁸⁻¹⁰. The narrowing of health inequalities, therefore, is dependent on narrowing inequalities in these fundamental causes.

Income inequality has widened enormously in Scotland, and across the UK as a whole, since the late 1970s¹⁰⁻¹². Income levels are measured in a number of UK surveys: however, in-depth analyses can be problematic because of limitations (e.g. sample sizes, representativeness) associated with such surveys. An obvious, and important, subset of income is employment earnings, and data on UK earnings can be analysed in considerable detail, for example by gender, place, time, occupation type, sector (public or private) and more. While there are clear limitations associated with such data – not least the exclusion of non-earners – it nonetheless potentially enables a detailed understanding of one important feature of income inequality. The overall aim of this work, therefore, was to explore trends in inequalities in earnings within Scotland and other parts of the UK to help inform efforts to narrow health inequalities in the country. In addition, the project sought to compare the trends with recent data for other, broader, measures of household income.

The specific research questions for the project were:

1. What do trends in the overall distribution of earnings in Scotland show?
2. How do these trends differ in Scotland compared with the other three UK nations, and across Scottish and UK cities?
3. To what extent do trends in the distribution of earnings differ in terms of: hours of employment (full-time or part-time); employment sector (public and private); occupation type?
4. How do recent data on minimum and 'real' living wage (RLW) levels compare across the countries and cities of interest?
5. What do trends in earnings by gender show (including across all the above categories)?
6. How do these recent trends in earnings compare with trends in broader household income?
7. What are the policy implications of the results of the research?

Methods

Earnings analyses

The source of the earnings data was the UK's Office for National Statistics (ONS)'s Annual Survey of Hours and Earnings (ASHE). The full methodology associated with this dataset is explained elsewhere^{13, 14}; briefly, however, it is based on a 1% sample of all employee jobs (i.e. excluding the self-employed) taken from HM Revenue and Customs 'Pay As You Earn' (PAYE) records^a.

Data were obtained for Scotland, England, Northern Ireland and Wales, and for 11 UK cities: Glasgow, Edinburgh, Aberdeen and Dundee in Scotland; and Liverpool, Manchester, Birmingham, Leeds, Sheffield, Bristol and London in England. These are the largest cities in Scotland and England respectively. Cities were defined by current local authority boundaries. Data were not available for Belfast. Note that all geographical areas are defined in terms of their place of *work*, not residence. This was to enable analysis of longer-term trends.

Data were requested in relation to: hours of employment (i.e. part-time, full-time); occupation type; employment sector (public and private); gender; and low pay (below minimum wage and below 'real' living wage (RLW)). Data were provided by ONS for analysis. However, all ASHE data are provided subject to strict 'suppression and disclosure control', and were coded by ONS in terms of their so-called 'statistical robustness'. Only data that were considered 'precise', 'reasonably precise' or 'acceptable' were included in the analyses. As a consequence not all data were available for all categories and geographical areas of interest.

The main indicator used was *gross weekly earnings*. This is the 'headline' indicator used by ONS in their ASHE statistical bulletins¹⁵. Data for all, full-time, and part-time employee jobs were analysed. ONS defines full-time employment as more than 30 hours per week; part-time employment is defined as 30 hours or less per week. For some aspects of the gender inequalities analyses, *hourly earnings* were also analysed. Most data were available for the period 1997-2016. Data on the minimum and RLW were obtained for 2016^b. The level of RLW was that defined by the Living Wage Foundation¹⁶: in 2016 this was set at £8.25 per hour outside London, and £9.40 per hour within London. The wage level for the UK government's defined 'living wage' (in effect the minimum wage) was: £3.30 per hour for apprentices; £3.87 per hour for age 16-17 years; £5.30 per hour for age 18-20 years; £6.70 for age 21-24 years; and £7.20 for age 25 years and above^c. Data for the RLW were available by Scottish (Westminster) parliamentary constituency area, as well as the cities and countries listed above. These data only include adults aged 18+ years. All estimates for the minimum wage and RLW provided by ONS were approximate and rounded.

In large part the analyses focused on *median* weekly earnings, as well as comparisons (where possible) of the broader distribution of earnings across the different areas. That distribution was

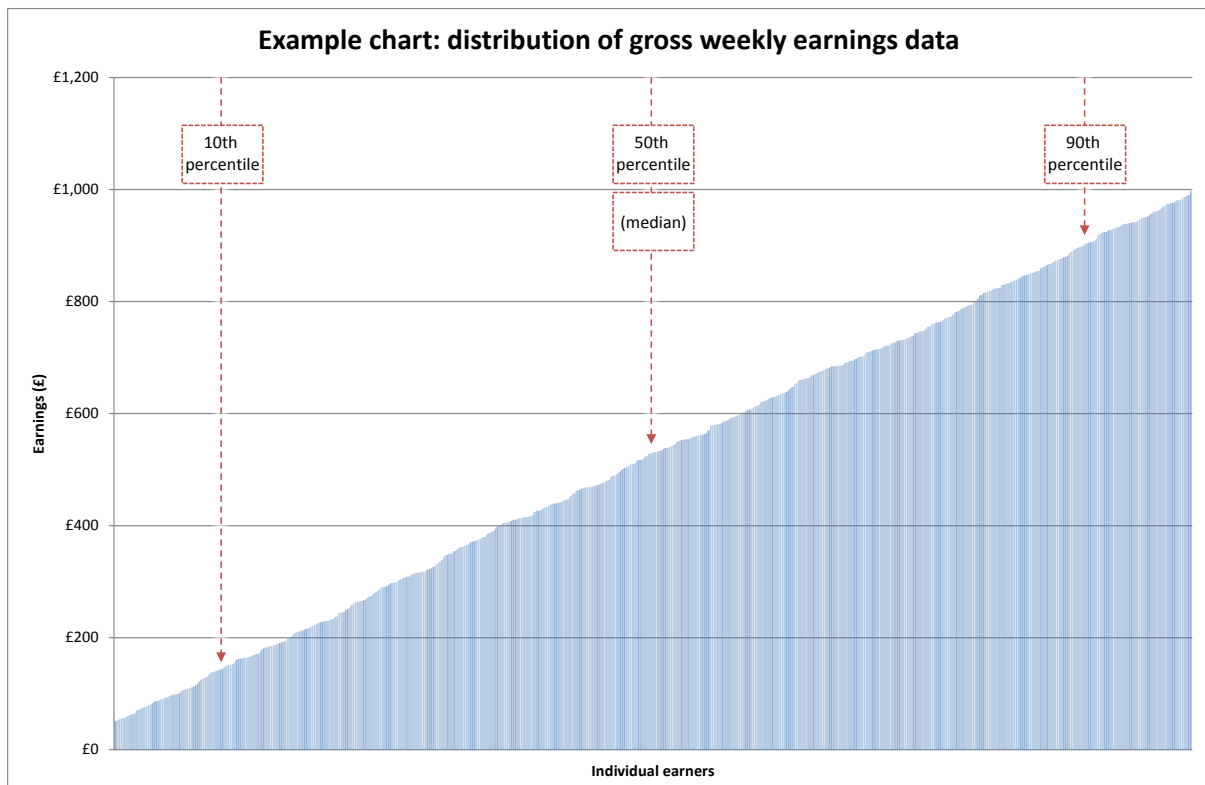
^a Note that the data source also excludes 'pay' that is paid as shares and employee benefits: thus, it will substantially underestimate the paid income of some of the highest earners in the UK.

^b Note that some updated data for the real living wage were additionally obtained for 2017. These data are discussed, but the primary analyses that are presented are for 2016.

^c Most of these components are still referred to as the 'minimum wage'; however, the rate for those age 25 years and above, although effectively still the legal minimum wage, is referred to by the UK government as the 'national living wage'. This is obviously different (and considerably lower than) the 'real' living wage, as defined by Living Wage Foundation.

defined in terms of percentiles – the 10th through to the 90th. As Figure 1 demonstrates, the 10th percentile represents the point in the earnings distribution above which 90% of values lie. Similarly, the 90th percentile is the point below which 90% of values lie. Thus, these are *single points* in the overall distribution: they do not represent the ‘top 10%’ or the ‘bottom 10%’. They are used to give an indication of the value of relatively low and relatively high earnings. The median value is the 50th percentile i.e. the mid-point of the earnings distribution. Note that Figure 1 is not based on real earnings data: they are just illustrative figures.

Figure 1.



The principal measures of inequality employed in the analyses were: the relative gap (defined as the 90th percentile divided by the 10th); the absolute gap (the 90th percentile minus the 10th); and the slope of the regression line across the percentiles^d.

Importantly, all data prior to 2016 have been adjusted for inflation. Thus, all values for 1997-2015 are shown in 2016 prices. The data were adjusted by means of the Consumer Price Inflation index¹⁷.

The data by occupation group provided by ONS are based on the Standard Occupational Classification (SOC) systems used in the UK. The classification system changed during the period covered by the analysis. The SOC2000 system covers the data presented for 1997-2010, and the SOC2010 system covers 2011-2016. This makes interpretation of some of the trends slightly problematic. The changes particularly affect the more highly paid occupational groups: managers,

^d This is another measure of absolute inequality. In charts where this is shown, m represents the slope or gradient of the regression line. This is from linear regression equation $y = mx + b$, where m is the slope of the line, b is the y axis intercept (i.e. where the line crosses the y axis), and x and y are co-ordinates for any point on the line. The slope is effectively the unit increase in y for each unit increase in x . Thus, the greater the value of m , the greater the level of inequality.

directors & senior officials^e; professional occupations; and associate professional & technical occupations^{18,19}. Thus caution should be exercised in examining trends, particularly for those groups, between the two periods.

The strengths and weaknesses associated with all aspects of the ASHE data are discussed later in the report.

Household income analyses

To set the analyses of earnings data in broader context, analyses of recent trends in total household income were also carried out.

Estimates of household income inequalities trends were requested from the Scottish Government. The estimates – for Scotland as a whole, but additionally broken down by Scottish local authority area – were derived from data collected within the Scottish Household Survey (SHoS)²⁰. Estimates of net annual household income by percentile (10th to 90th) for the years 1999/2000 to 2016 were obtained. Note that *net* income refers to income after taxation and other deductions from employment, social security benefits and other sources. As with the earnings analyses, all figures were adjusted for inflation using the Consumer Price Index and are presented in 2016 prices. The same crude measures of absolute and relative inequality (90th-10th percentiles, and 90th/10th percentiles respectively) were calculated; however, in addition two further statistical measures of the income inequality were calculated for each year: the Palma ratio and Gini coefficient. The former is the ratio of the richest 10% of the population's share of income divided by the share of the poorest 40%²¹, while the Gini coefficient measures the dispersion of the whole income distribution (i.e. rather than just comparing the extremes) and has a theoretical value ranging from 0 (representing complete equality) to 1 (representing complete inequality)²².

Note that the income data collected in SHoS differs to those collected in other surveys such as the Family Resources Survey (FRS)²³. The SHoS data are based only on the income data for the 'Household Reference Person' (HRP) and (if applicable) their spouse, whereas the FRS includes income from *all* household members. Standard OECD 'equivalisation' factors have been applied to the household income figures to take account of household size and composition²⁴. There are particular limitations to this approach given that the household income does not include income from additional adults; however, no better equivalisation approach currently exists.

For the years 1999-2011, two years of data have been combined together; single years of data have been used for 2012-2016. This reflects a change in survey design which took place in 2011 (and for a related reason, data for 2011 itself are not shown). Although sample sizes are generally considered large enough for analysis at local authority level, some of the year-on-year changes and differences between local authorities will be due to sampling (or other) error rather than real differences in incomes in the population. For that reason only very limited data are shown at local authority area level, and trends in these data should be interpreted with caution.

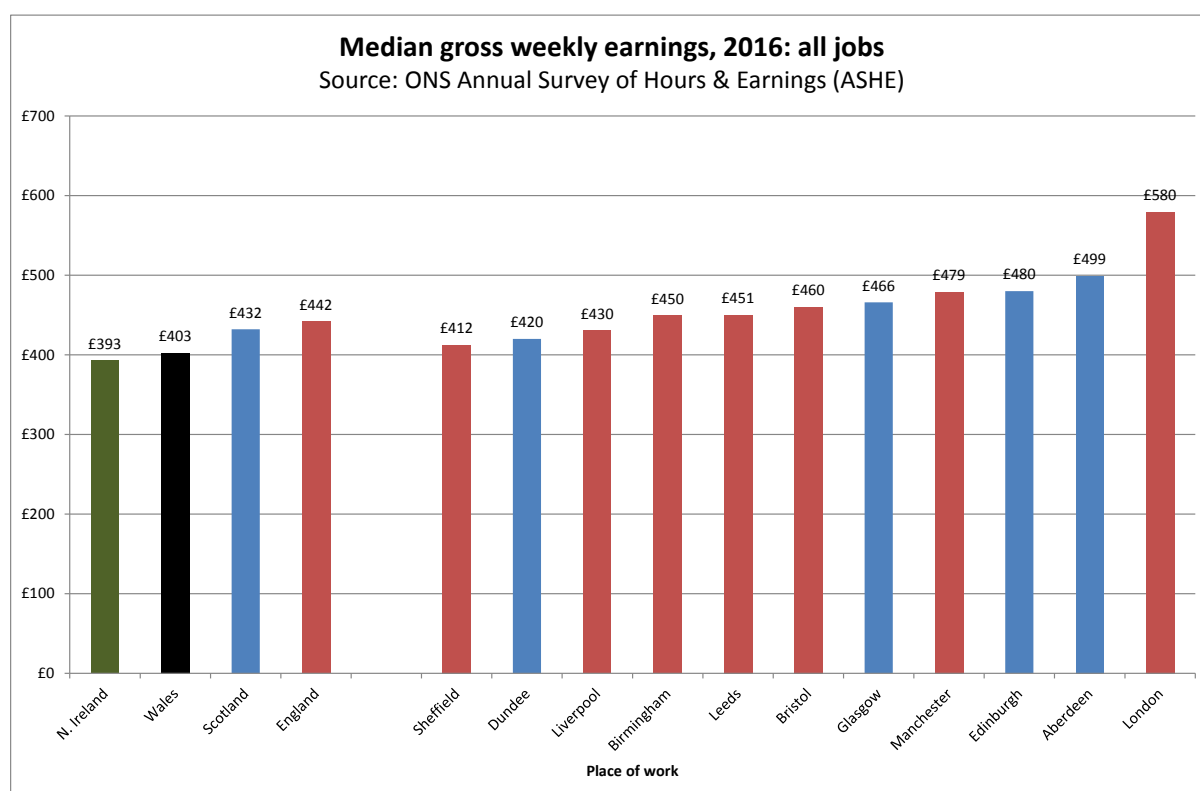
^e Note that this is the SOC2010 classification grouping name. In SOC2000 this was called 'managers and senior officials'.

Results

1. How do median earnings compare across the countries and cities of interest?

Before considering the *distribution* of earnings, it is worth considering first the extent to which levels of earnings vary across the countries and cities included in the analyses. Figure 2 shows median weekly earnings in 2016. These were notably higher in London than elsewhere; earnings in Aberdeen were the highest in Scotland^f. However, in interpreting these figures it is obviously important to take into account differences in the cost of living across all the locations, and these are not accounted for here.

Figure 2.

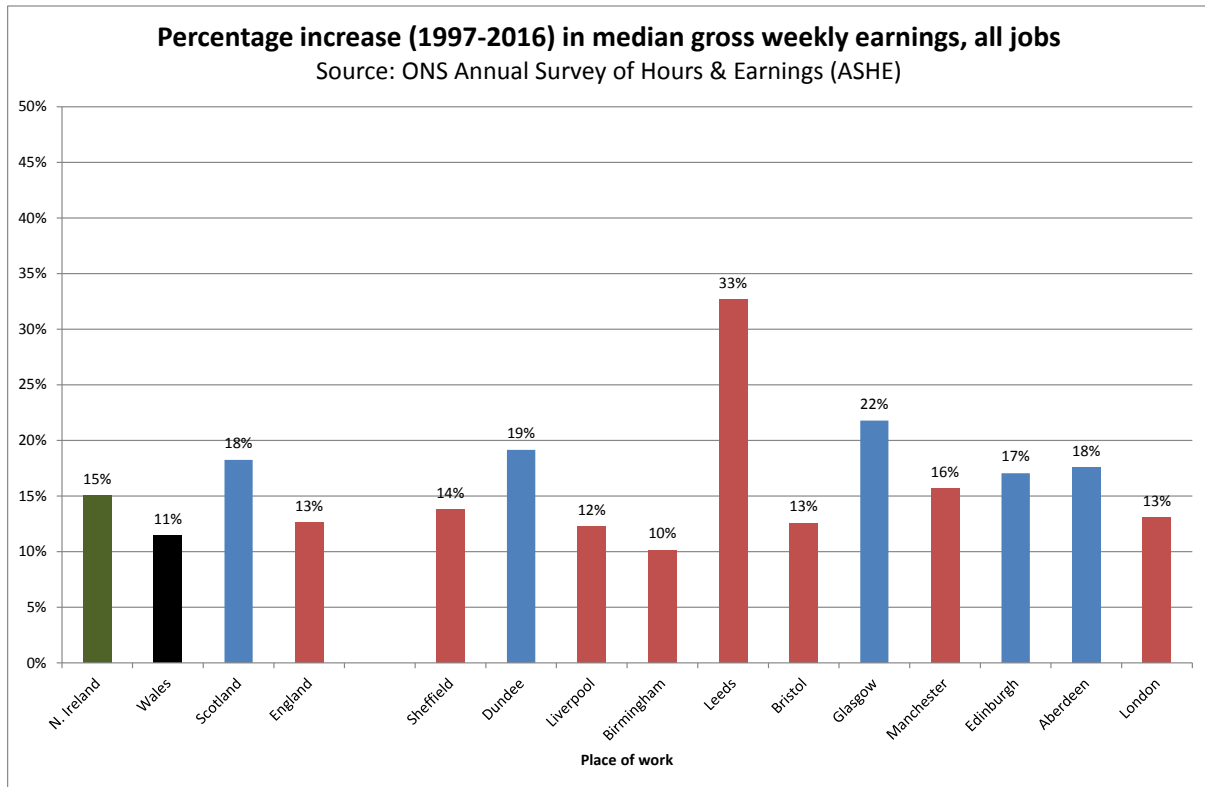


Similar differences across the countries and cities are observed in analyses of full-time jobs only; however, there is much less variation in earnings from part-time jobs (data not shown). Differences between male and female earnings are discussed separately later in the report.

^f The figure for London was, notably, around 30% higher than the equivalent figure for all England. The figure for Aberdeen was approximately 15% higher than the figure for Scotland.

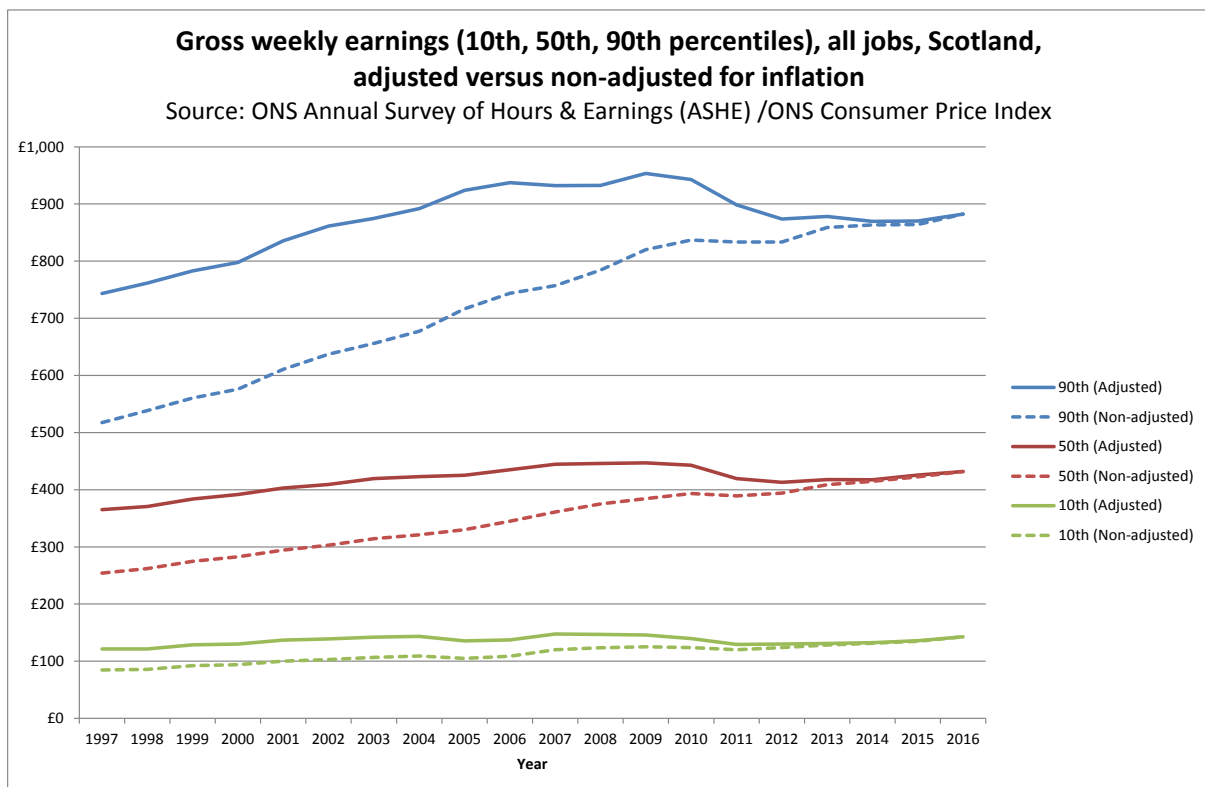
Figure 3 shows the percentage increase in median weekly earnings between 1997 and 2016: for all employee jobs, wages generally increased by approximately 10-20% over the period. The increases were generally higher in Scotland, although by far the greatest observed rise was in Leeds in England.

Figure 3.



In terms of change over time in earnings, Figure 4 – showing gross weekly wages for the 10th, 50th (i.e. median) and 90th percentiles for all jobs in Scotland over the period of analysis – illustrates both the impact of adjusting for inflation, and also the effect of the recent recession and economic downturn on wages. Without adjusting for levels of inflation (the dotted lines on the chart), it appears that gross earnings increased almost every year. However, adjustment for inflation shows that *in real terms* median earnings in Scotland decreased from 2008 to around 2014, and by 2016 (the last period for which data are available) they were notably below their peak in 2009. Adjusted trends for all percentiles (rather than just the 10th, 50th and 90th) are shown in the next section of the report.

Figure 4.



2. Changes in the distribution of earnings

Figure 5 presents the distribution of earnings for all employee jobs in Scotland in 1997 and 2016. As stated in the Methods section, earnings for 1997 have been adjusted for inflation and thus are shown in 2016 prices. As also described earlier, the values of m on the chart represent the scale of absolute inequalities across the distribution. The Figure, therefore, shows that in absolute terms inequalities in earnings have increased over the 20-year period of analysis. However, limiting the analysis in this way to two single points in time in fact masks a more complicated trend. Figure 6 presents the data as a line chart which includes every single year of analysis (1997-2016). That suggests that inequalities in the distribution of earnings increased between 1997 and around 2010, but then decreased in subsequent years. This is confirmed in Figure 7 which shows trends in absolute and relative inequalities by year: at the start of the period, the wages of high earners (the 90th percentile) were 6.1 times greater than the wages of low earners (the 10th percentile); this increased to 6.9 times greater in 2011, but then fell back to 6.2 times by 2016. In absolute terms the gap in weekly earnings between the 10th and 90th percentile increased from £622 (in 2016 prices) to £739 over the period, peaking at over £800 in 2009.

Figure 5.

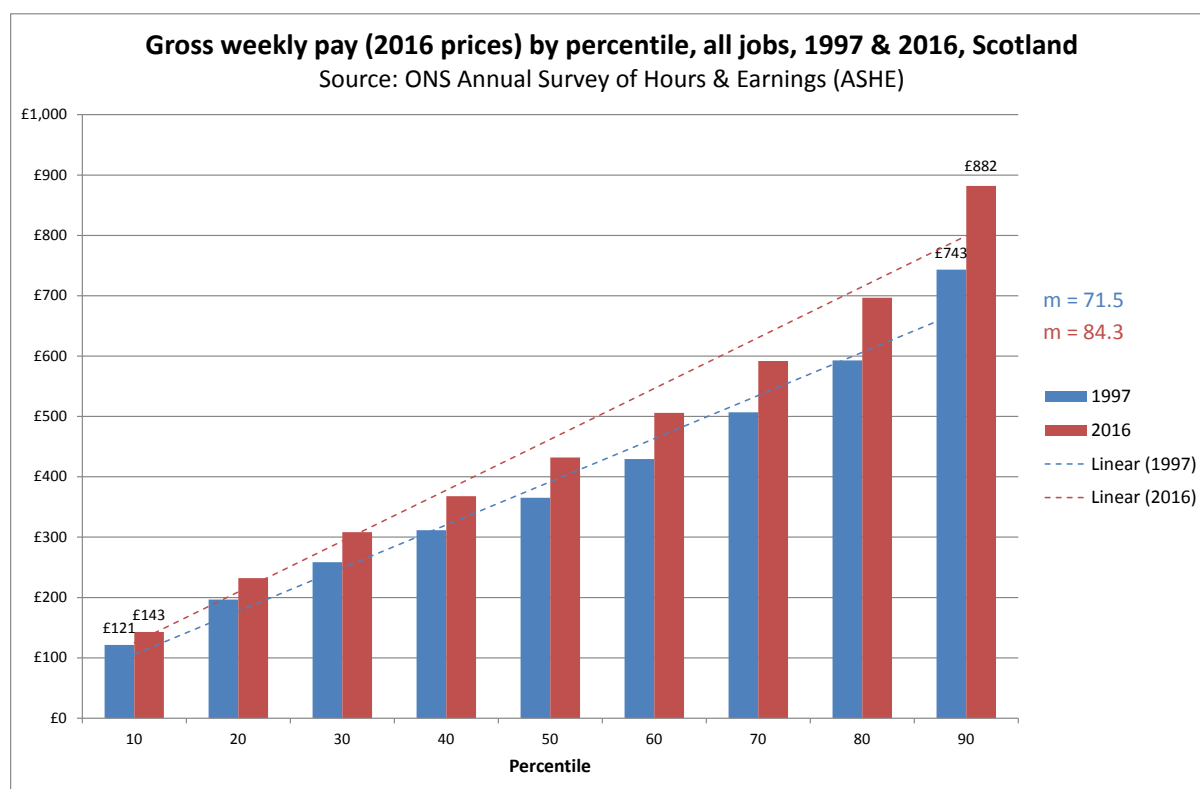


Figure 6.

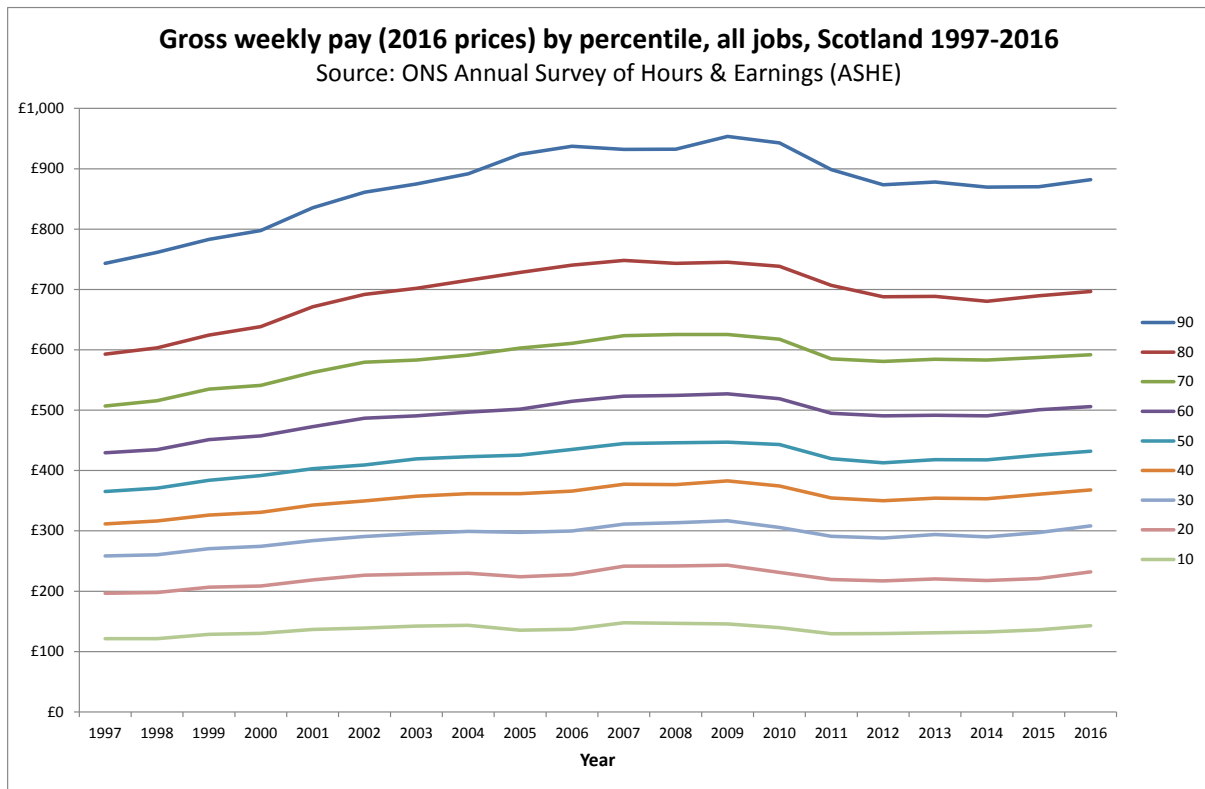


Figure 7.



The trends observed in Scotland over the period are broadly similar to those seen in the other UK nations, although earnings at the top end of the distribution tend to be higher in England and lower in Wales, with inequalities also greater and lower respectively in those countries. Figures 8 and 9 show trends in earnings and inequalities respectively in all four countries.

Figure 8: Gross weekly pay (2016 prices) by percentile, all jobs, four UK nations, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).

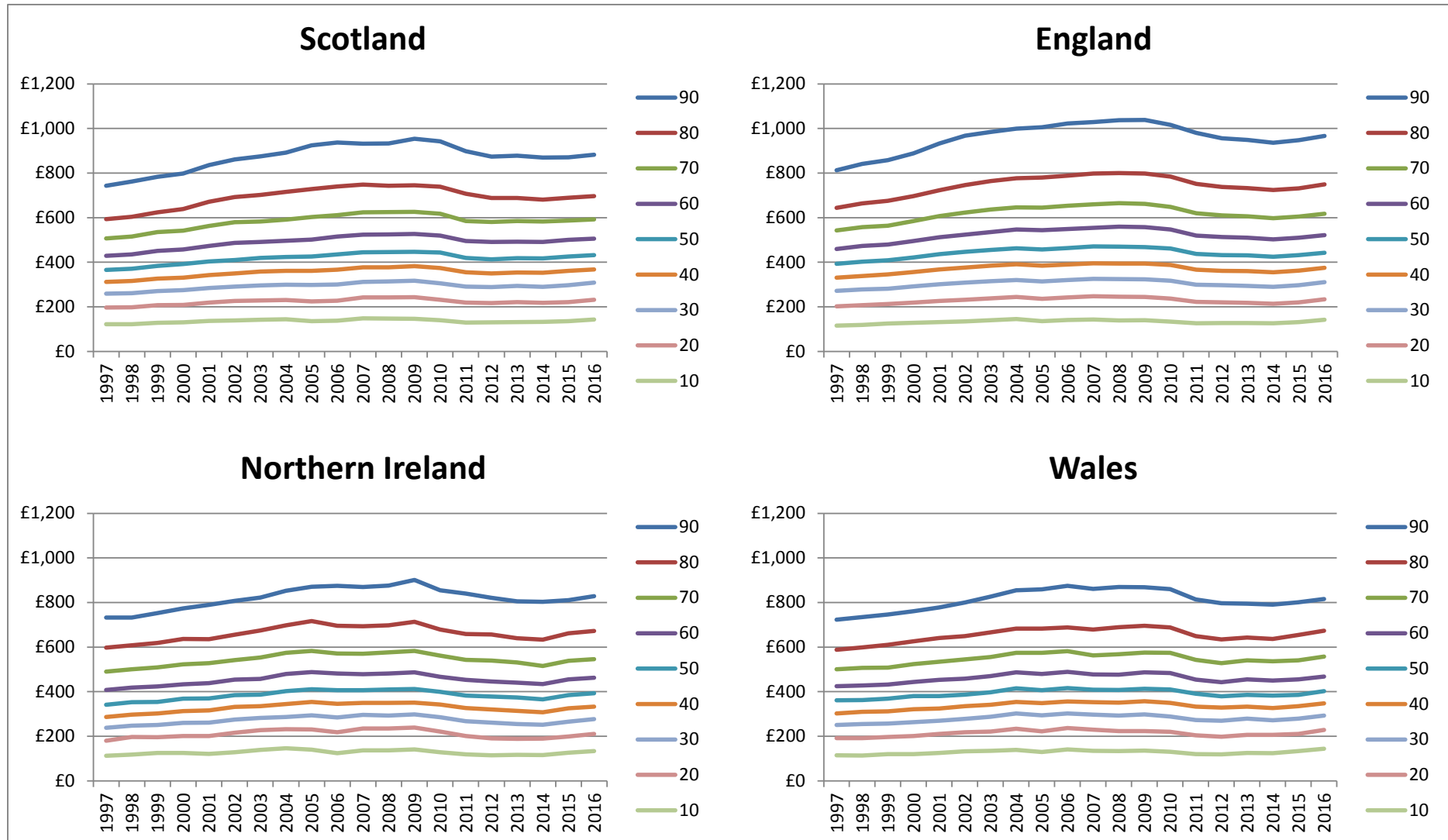
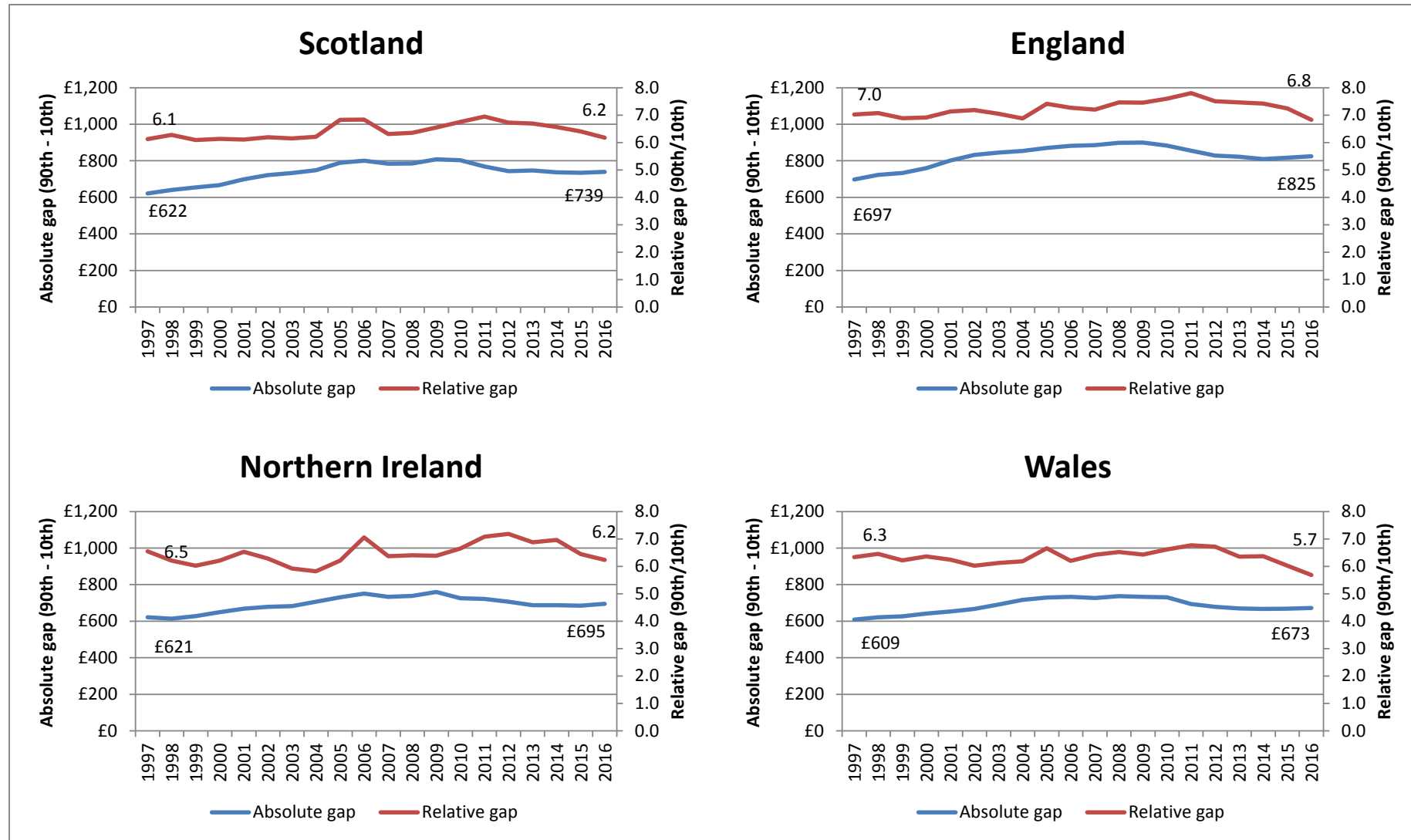


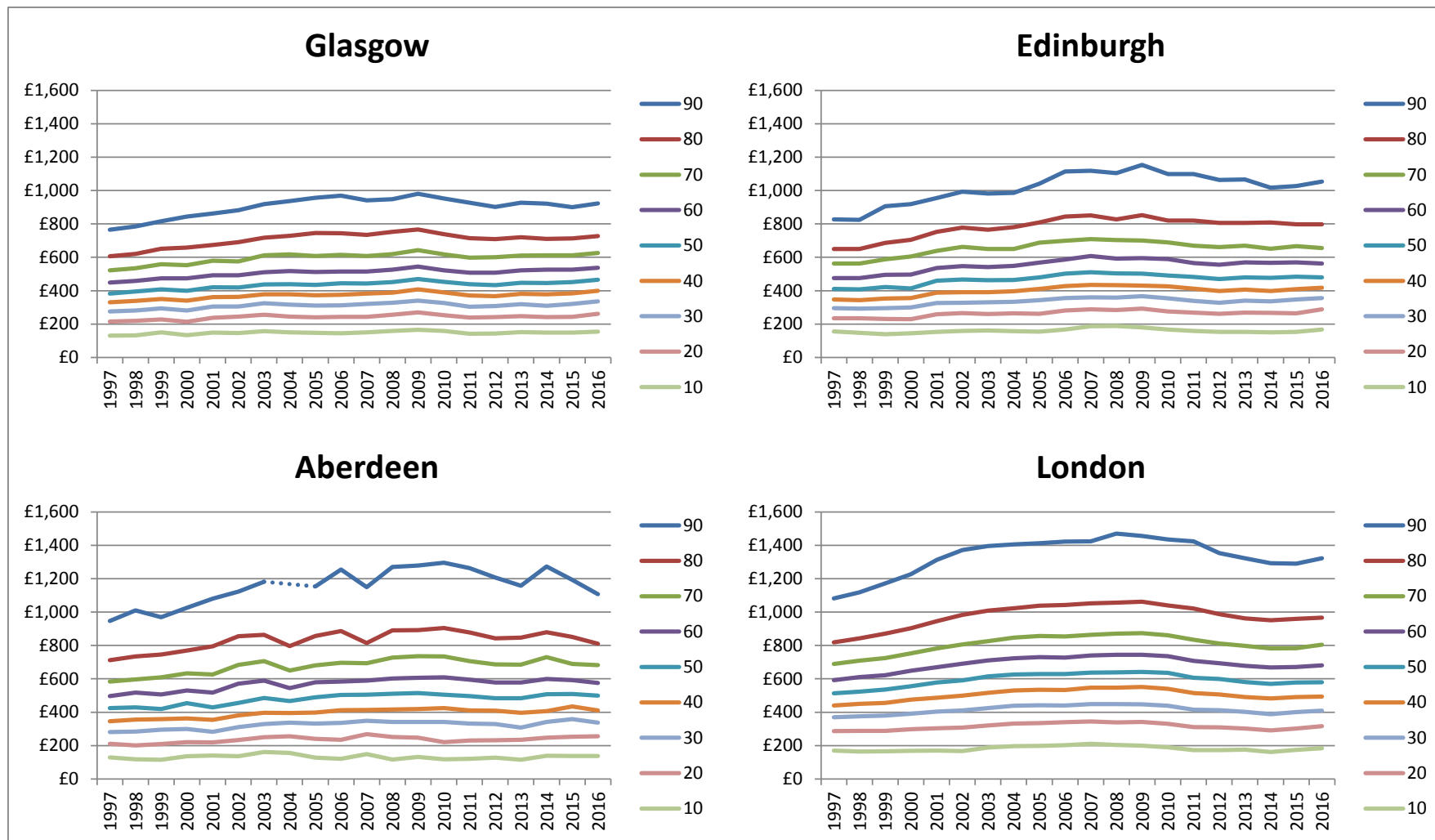
Figure 9: Absolute and relative inequalities in gross weekly earnings (2016 prices), all jobs, four UK nations, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



Similar trends in earnings and inequalities are shown for four of the cities of interest (Glasgow, Edinburgh, Aberdeen and London) in Figures 10 and 11. It is notable that absolute and relative earnings inequalities are higher in Edinburgh and, especially, Aberdeen, compared with Glasgow. Although London has the widest absolute gap across the earnings distribution, in a relative sense inequalities have been, and remain, widest in Aberdeen.

Note also that the y axes in Figures 10 and 11 are on a different scale to those shown in Figures 8 and 9 above (because of the greater scale of inequalities in cities like Aberdeen and London).

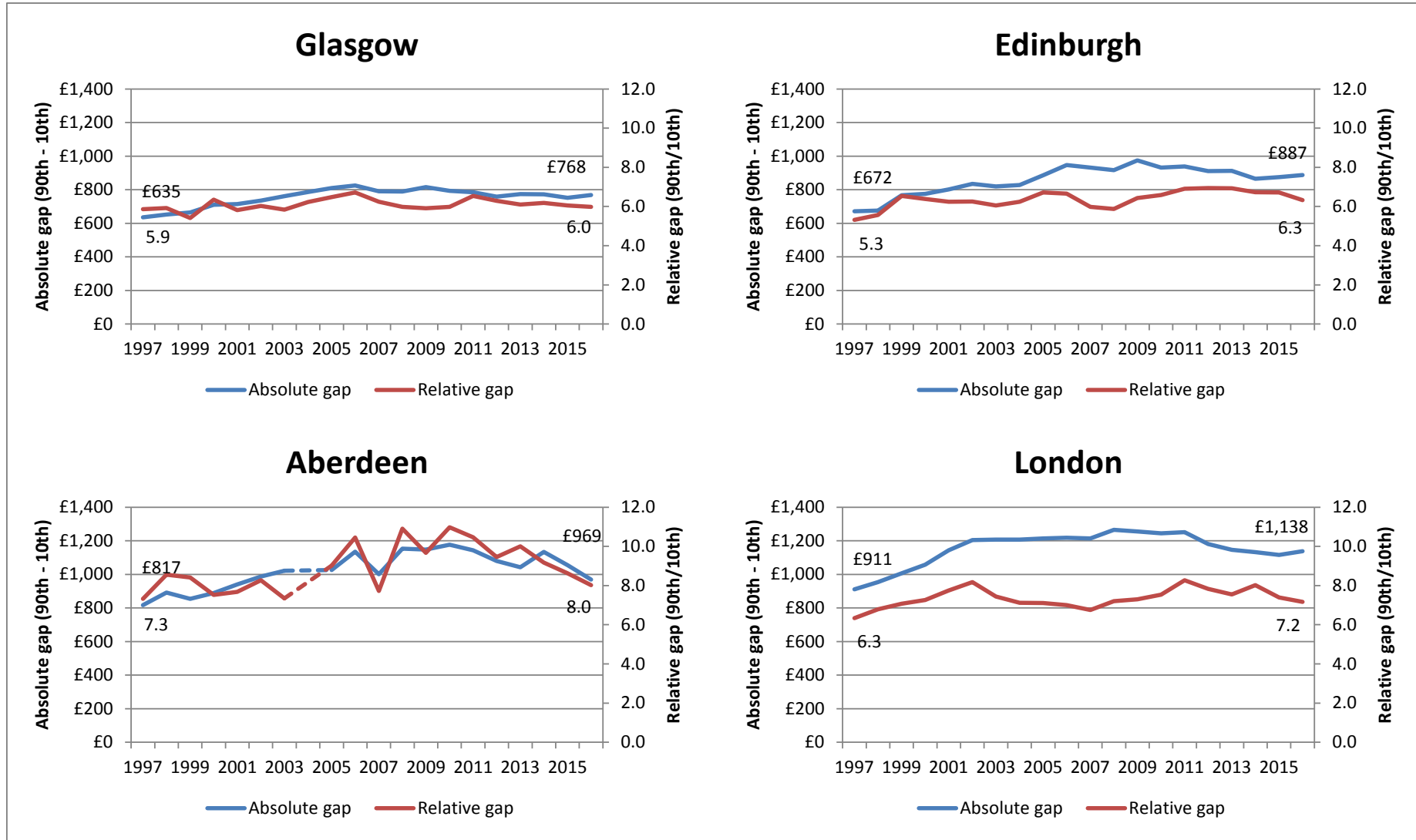
Figure 10: Gross weekly pay (2016 prices) by percentile, all jobs, Glasgow, Edinburgh, Aberdeen^{vii} and London, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



^{vii} Data not available for Aberdeen 90th percentile in 2004: hence the dotted line connecting 2003 and 2005.

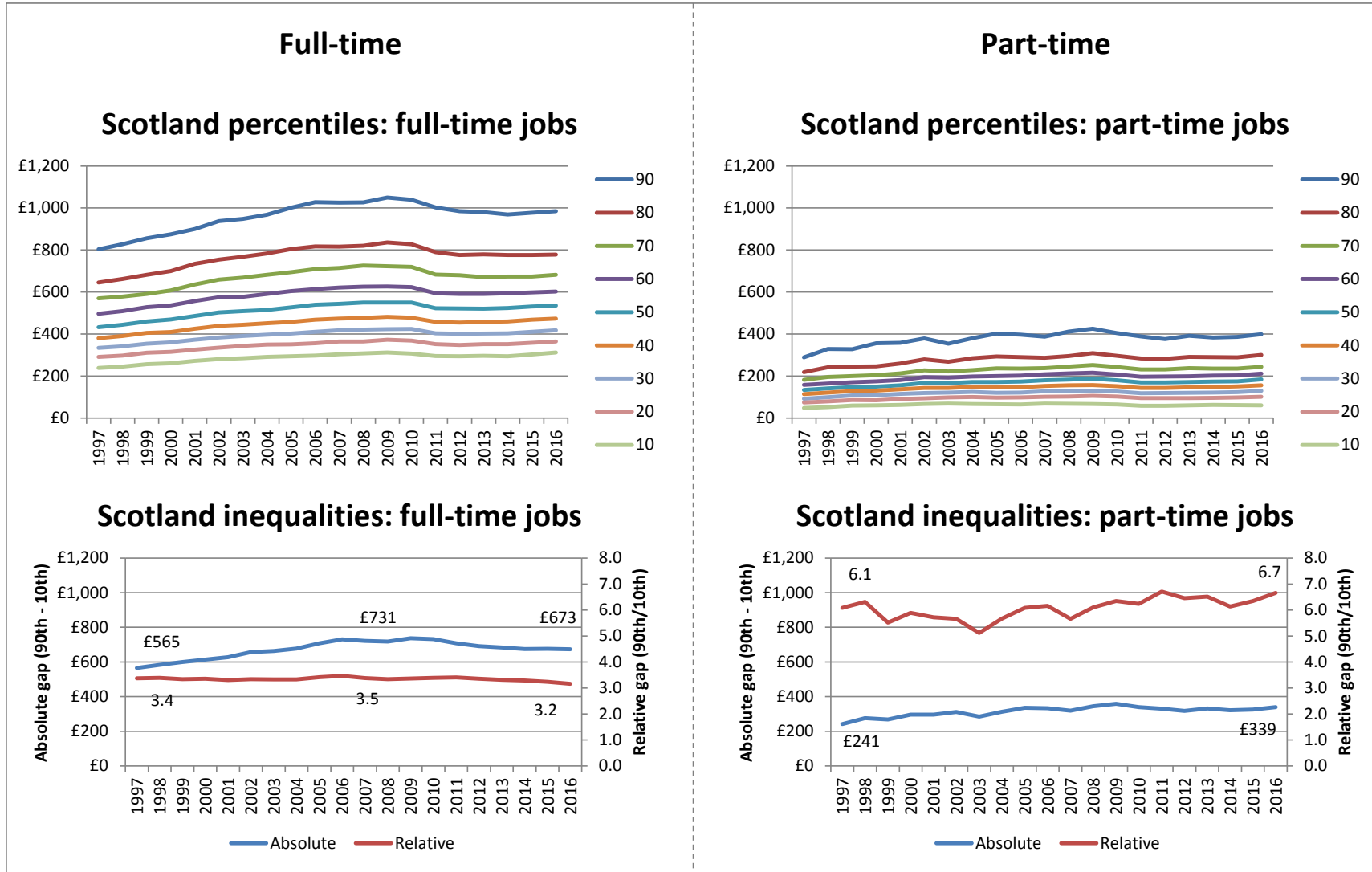
Figure 11: Absolute and relative inequalities in gross weekly earnings (2016 prices), all jobs, Glasgow, Edinburgh, Aberdeen and London, 1997-2016.

Source: ONS Annual Survey of Hours & Earnings (ASHE).



Analyses of *full-time* employee jobs show a similar overall trend of increasing, and then decreasing, *absolute* earnings inequalities. However, relative inequalities are – unsurprisingly – lower, and the trends in those inequalities have been flatter. The scale of relative inequality in earnings is much greater for *part-time* employee jobs. As stated in the Methods section, part-time employment is defined in terms of 30 hours or less per week: thus the variation in numbers of hours worked in a week is an important consideration, and this is discussed later in the report. These trends in earnings by percentile and associated inequalities for full-time and part-time employee jobs are shown in Figure 12 for Scotland. The data for the rest of the UK are broadly similar.

Figure 12: Gross weekly pay (2016 prices) by percentile, and associated absolute and relative inequalities, for full-time versus part-time employment, Scotland 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



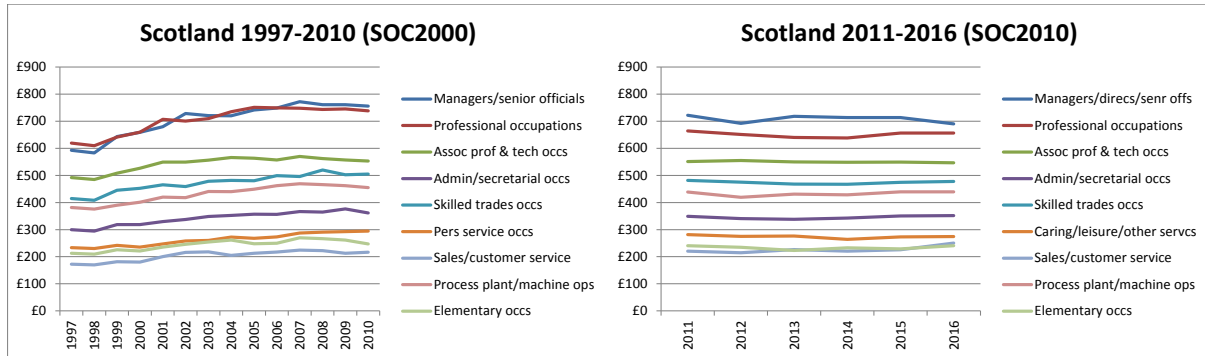
3. Earnings by occupation

As stated in the Methods section, the Standard Occupational Classification (SOC) system changed in 2011. Thus two systems cover the period of analysis presented here. The change principally affects the more highly paid occupational groups. This makes interpretation of trends in these groups slightly problematic, especially as the change in system coincided with the downward trend in earnings shown in the previous section.

Figure 13a shows trends in median earnings for all jobs (part-time and full-time) by occupation group for people working in Scotland. The left hand chart shows the period 1997-2010 (when the SOC2000 system was employed); the right hand chart covers 2011-2016 (using the SOC2010 system). Figure 13b below it shows trends for the whole time period. Irrespective of the change in classifications, the trends shown are broadly similar to those shown in the previous section i.e. with a widening gap observed between the highest-paid and lowest-paid occupations in the earlier period of analysis. For example, between 1997 and 2010, the earnings of those employed as managers and senior officials in Scotland increased by 28%, whereas the earnings of those employed in elementary occupations increased by 16%. It is also notable that in real terms (i.e. as the data are adjusted for inflation) there were decreases in the weekly earnings in a number of occupation groups from around 2008 (i.e. the time of the recession).

Figures 13a & 13b: Gross weekly earnings (2016 prices) by occupation classification, all jobs, Scotland, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).

a)



b)

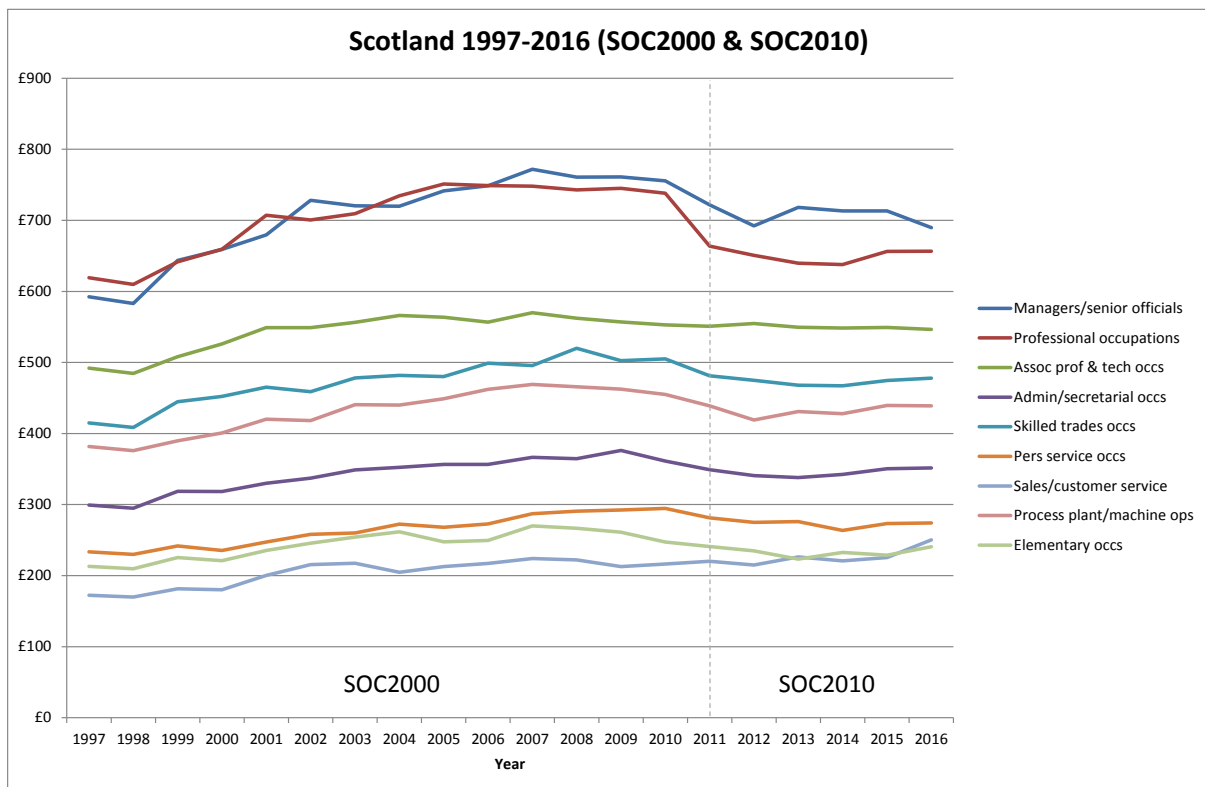
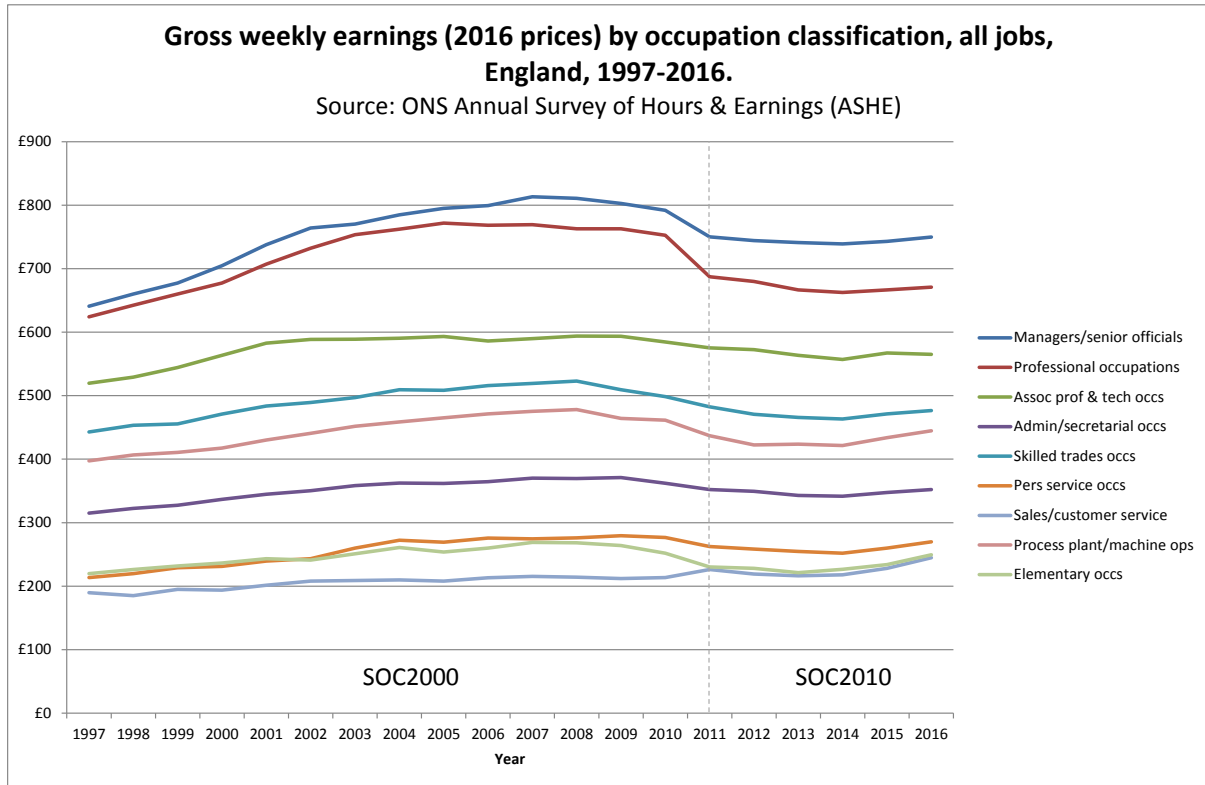


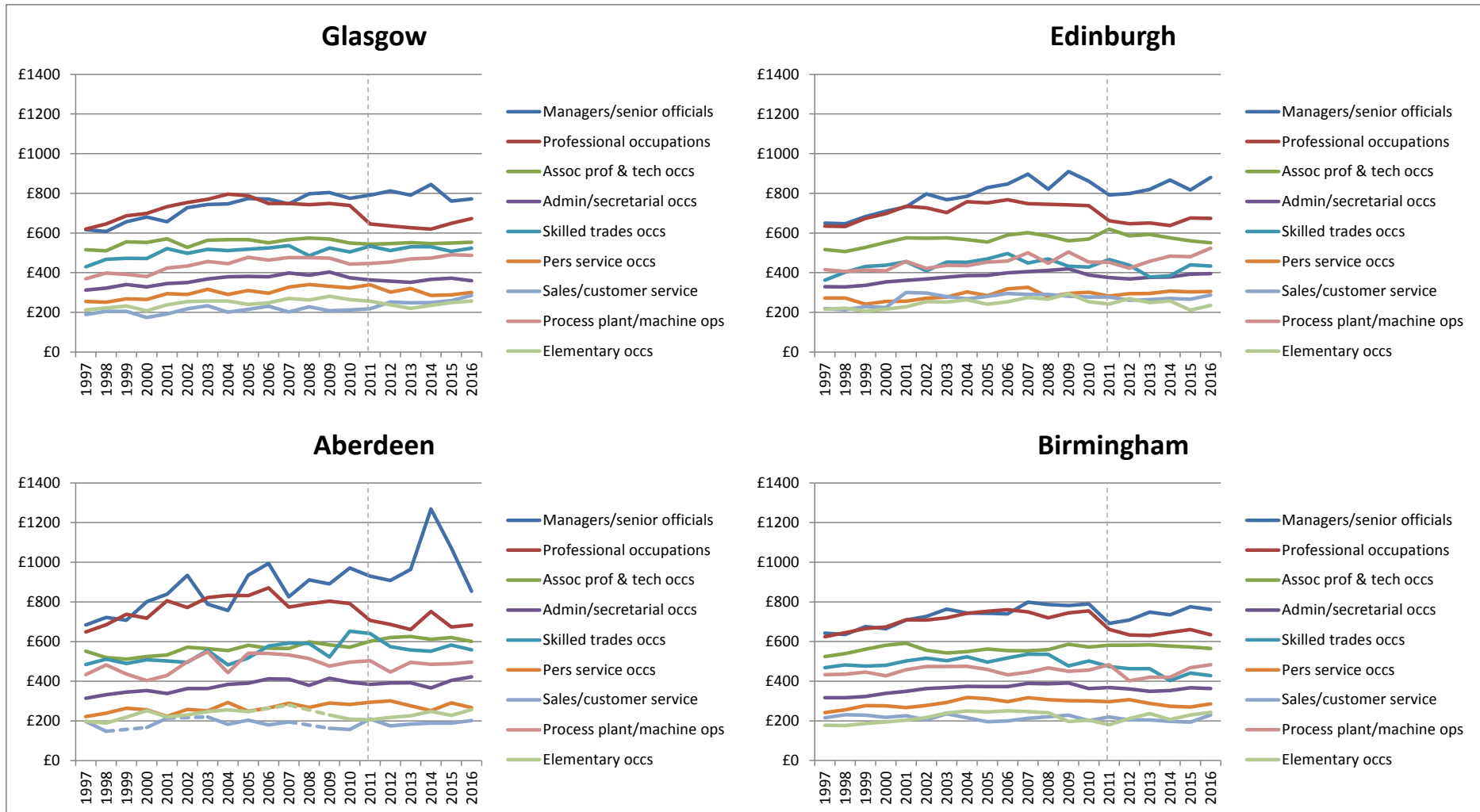
Figure 14 presents similar data for England for the whole time period combined. In both Scotland's and England's case, the widening inequality across occupation groupings appears to be particularly driven by increases in the two highest-earning occupational groups between 1997 and 2010.

Figure 14.



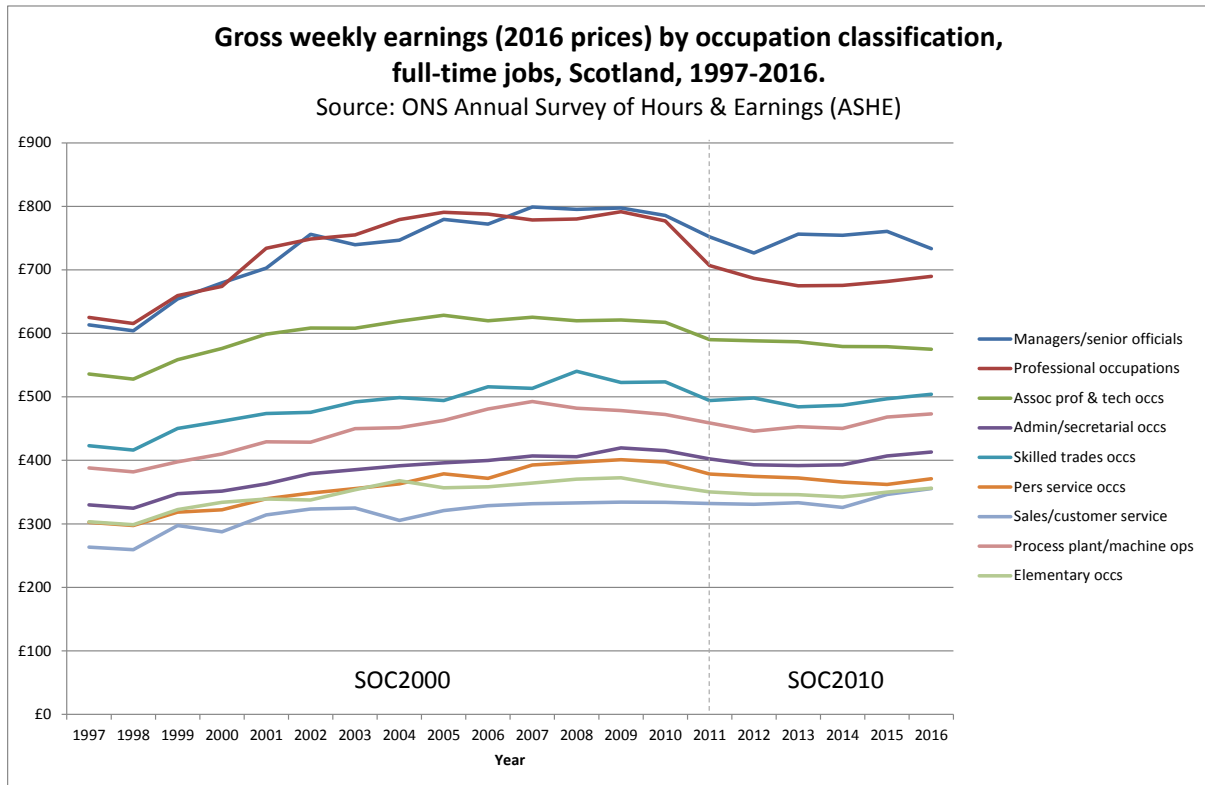
The same trends for Glasgow, Edinburgh and Aberdeen (and for comparison, Birmingham) are shown in Figure 15. Note that because of the high level of earnings among managers, directors & senior officials in Aberdeen, a different y-axis scale has been used. As with the trends by percentile shown in the previous section, a notable decrease in earnings in the last two years of the analysis is apparent for this occupational group in Aberdeen.

Figure 15: Gross weekly earnings (2016 prices) by occupation classification, all jobs, Glasgow, Edinburgh, Aberdeen and Birmingham, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



In terms of full-time jobs (rather than all employee jobs), the trends are similar, although a greater gap is evident between associate professional and technical occupations and the other less well-paid occupational categories. This is shown in Figure 16 for Scotland; trends are generally similar in other parts of the UK.

Figure 16.



Differences in earnings between men and women by occupational group are presented later in this report.

4. Earnings in the public and private sectors

In 2016 jobs in the public sector accounted for approximately one third of all employee jobs in Scotland. Across Scottish cities the percentage of employee jobs in the public sector ranged from 26% in Aberdeen to 43% in Dundee. This highlights the importance of the public sector to the overall distribution of earnings in Scotland, and to its potential role in any attempts to narrow inequalities. The figures were similar in Wales and Northern Ireland, but notably lower in England: 23%. However, in cities like Sheffield, Liverpool and Manchester the figures were higher at around 30%. These data are all presented in Figure 17.

Figure 17.

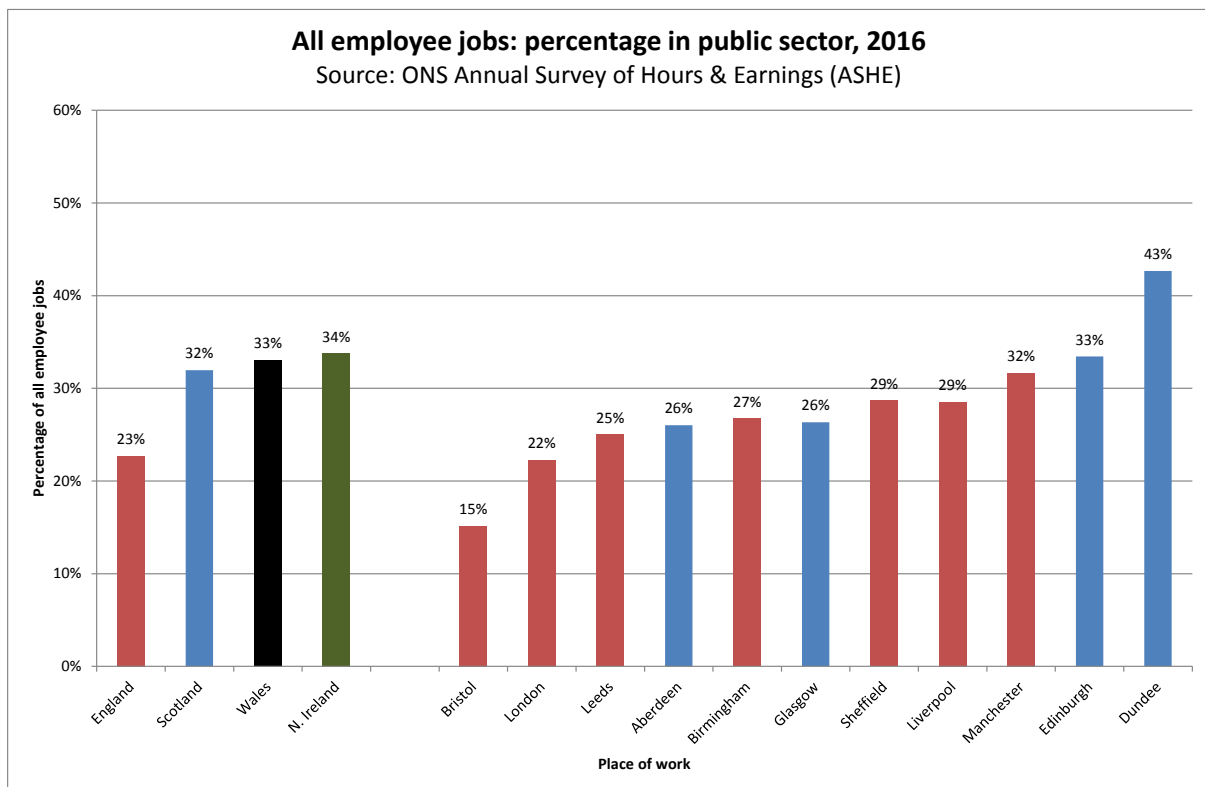
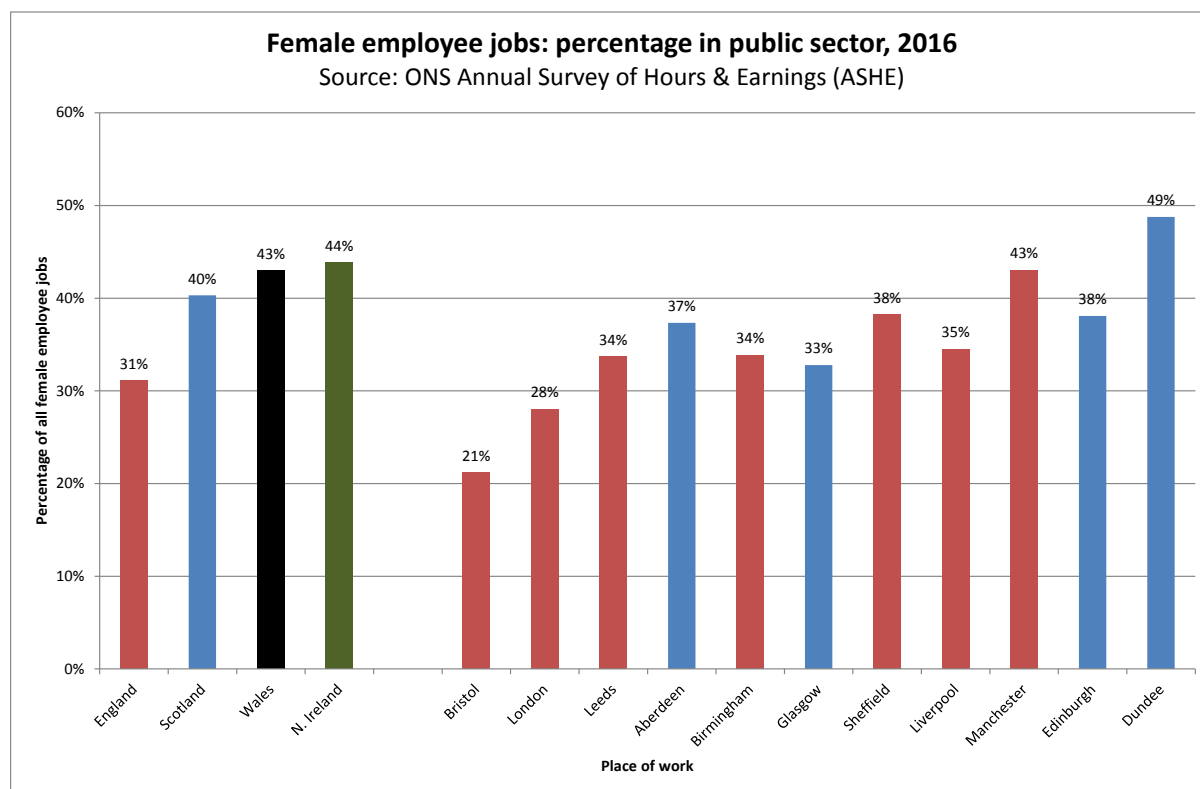


Figure 18 shows that the percentage of all *female* employee jobs that are in the public sector is much higher: in 2016 the figure was 40% in Scotland (ranging from 33% in Glasgow to as high as 49% in Dundee^{viii}). In England the figure was again lower (31%), but with a considerable variation across the English cities included in the analysis: from 21% in Bristol to 43% in Manchester.

Figure 18.



Analysis of trends for both all jobs and female jobs in the public sector show that the proportions have changed little since 1997 in Scotland, England and Wales, but have fallen in Northern Ireland (from 42% to 34% for all jobs, from 49% to 44% for female jobs (data not shown)).

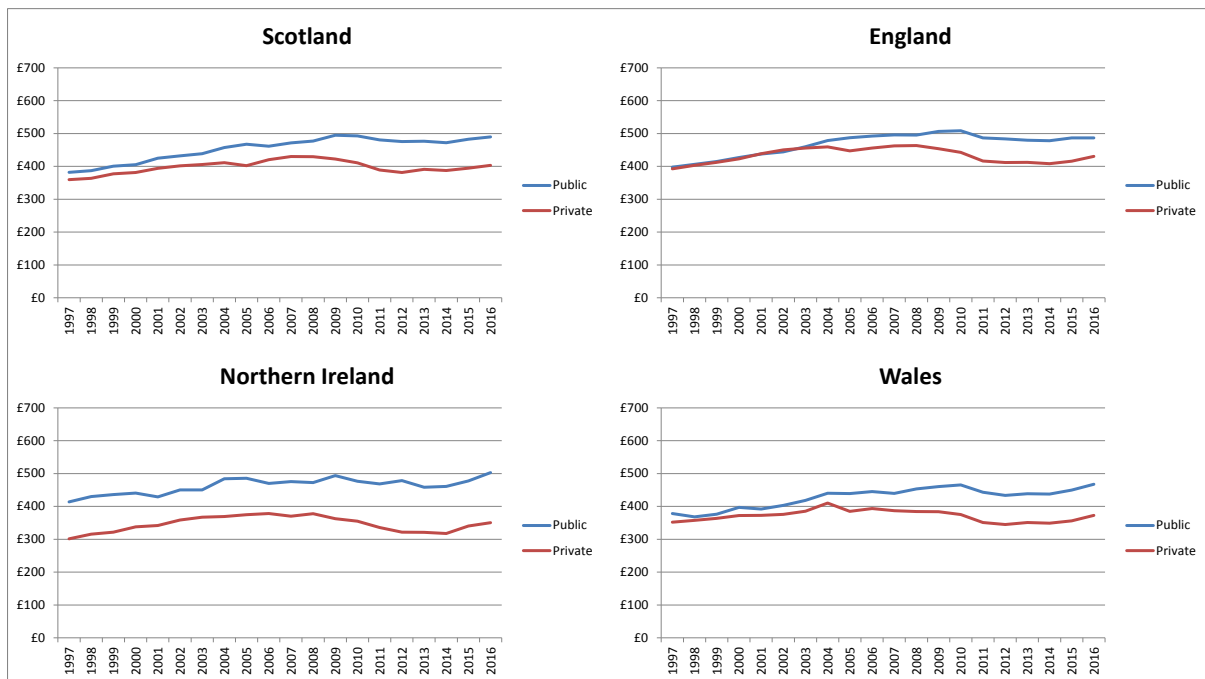
It should be remembered that as ASHE does not include the self-employed, these figures over-estimate the true proportion of *all* jobs that are in the public sector. However, it is possible to estimate the likely true figure by means of a crude adjustment to the data^{ix}. This suggests that the true figures are likely to be only marginally smaller: for example 28% (rather than 32%) of all jobs in Scotland, and 37% (rather than 40%) of all female jobs in Scotland.

In terms of median earnings in the public and private sectors, levels have generally been higher in the former, and there is some evidence of a widening gap between the sectors since around 2008: the fall in earnings in real terms since around 2008 has been much more pronounced in the private sector. Figure 19 shows trends in median weekly earnings for both sectors and for the four UK nations.

^{viii} Note that employees of the Royal Bank of Scotland are included in these figures as 'public sector' workers because the bank was taken into public ownership in 2008 at the time of the financial crisis. As the bank's Scottish headquarters is in Edinburgh, this will particularly impact on the figures shown for that city.

^{ix} This was done by using 2011 Census employment data to calculate an adjusted denominator for the ASHE data to include the likely number of self-employed jobs.

Figure 19: Median gross weekly earnings (2016 prices), all jobs, by private and public sectors, 4 UK nations, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



This picture (higher median earnings in the public sector, and a widening gap between the sectors over time) is also true of most UK cities, although some exceptions apply. One such exception is Aberdeen where median earnings have been higher in the private sector. Figure 20 shows trends for the four Scottish cities and Figure 21 presents similar data for London, Birmingham, Manchester and Liverpool.

Figure 20: Median gross weekly earnings (2016 prices), all jobs, by private and public sectors, 4 Scottish cities, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).

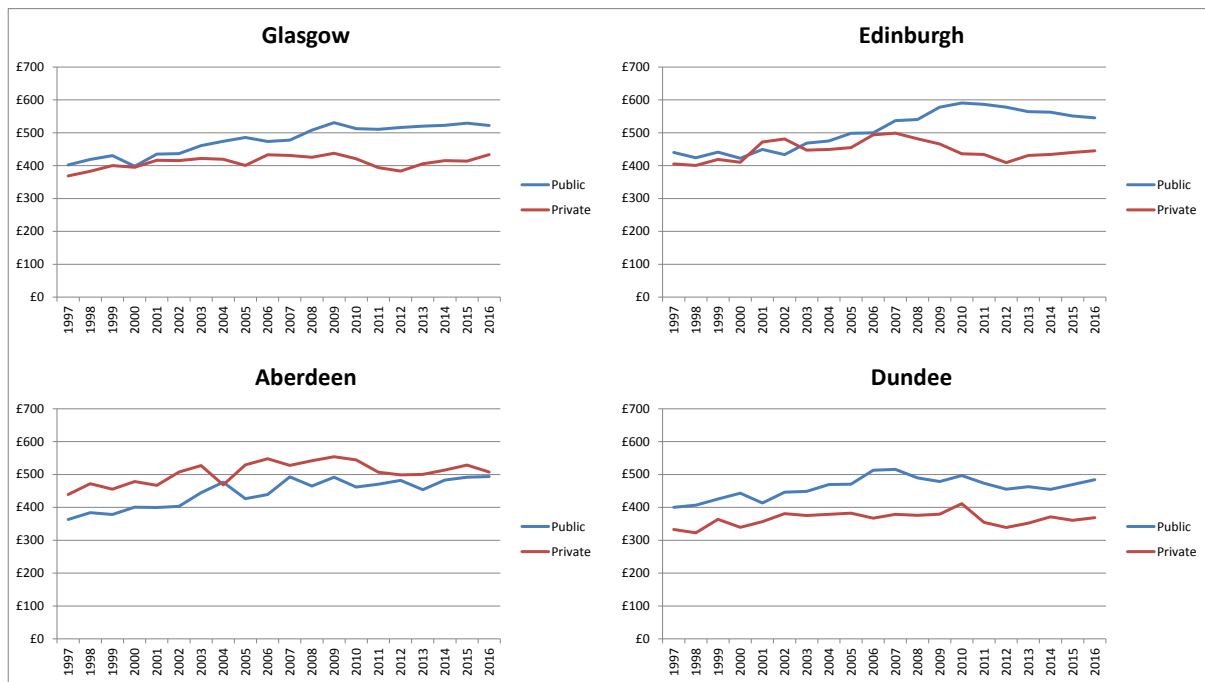
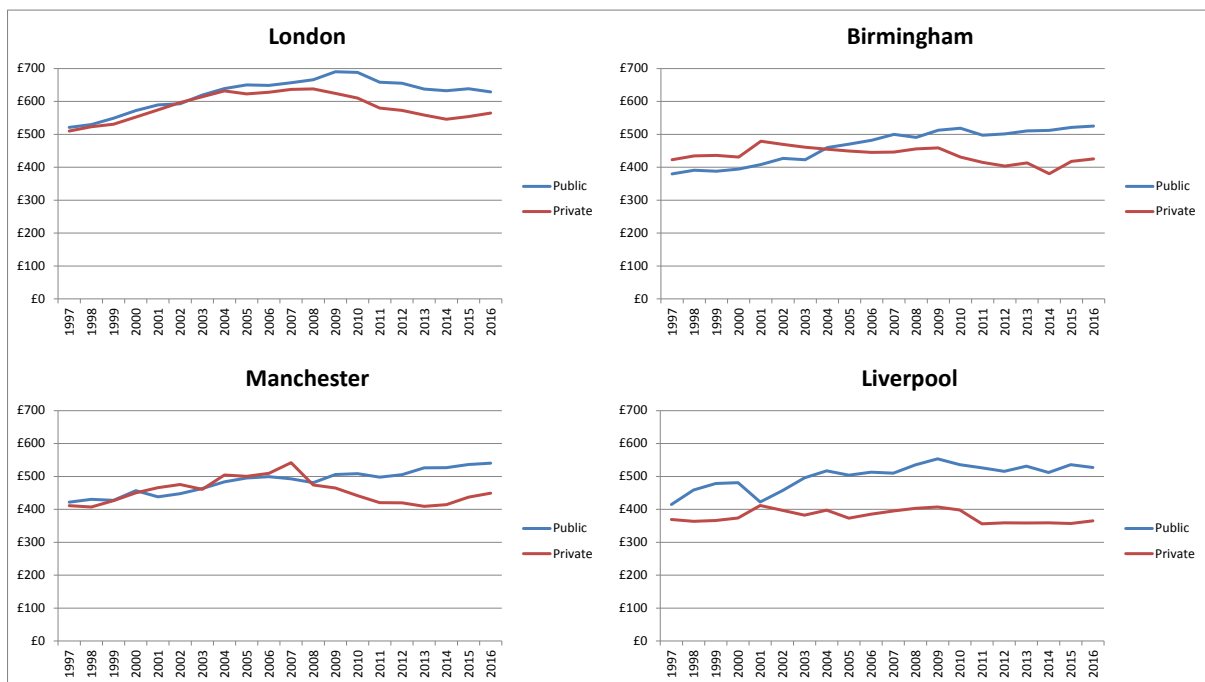
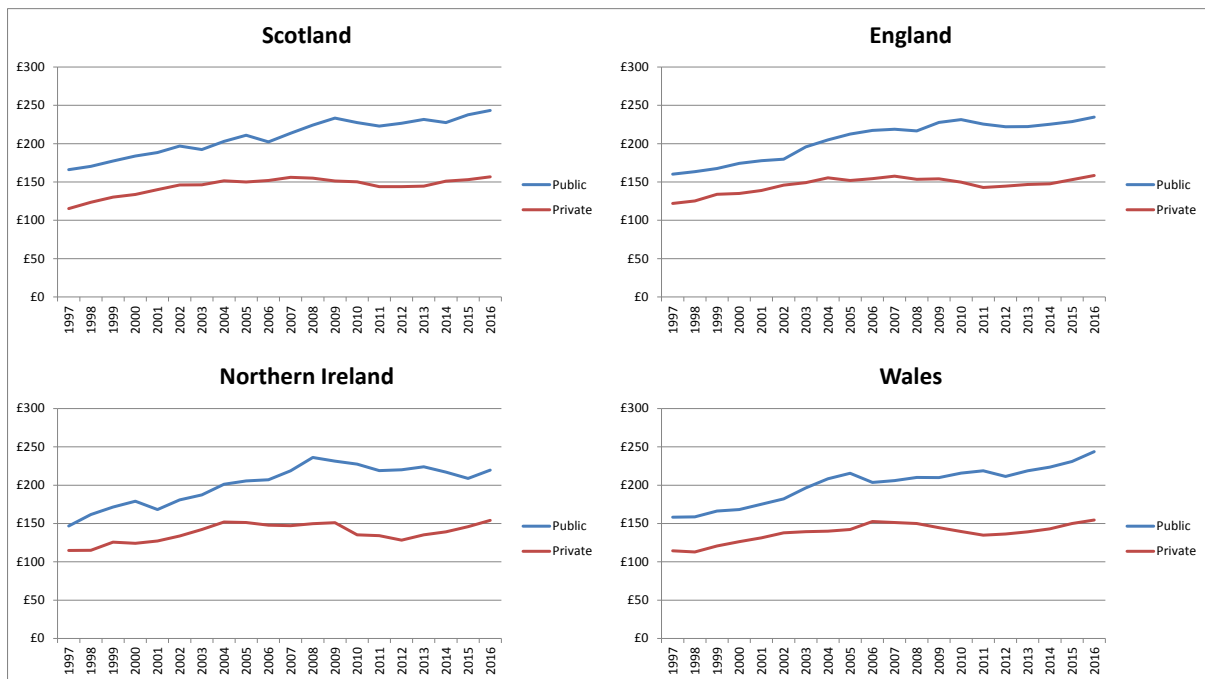


Figure 21: Median gross weekly earnings (2016 prices), all jobs, by private and public sectors, 4 English cities, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



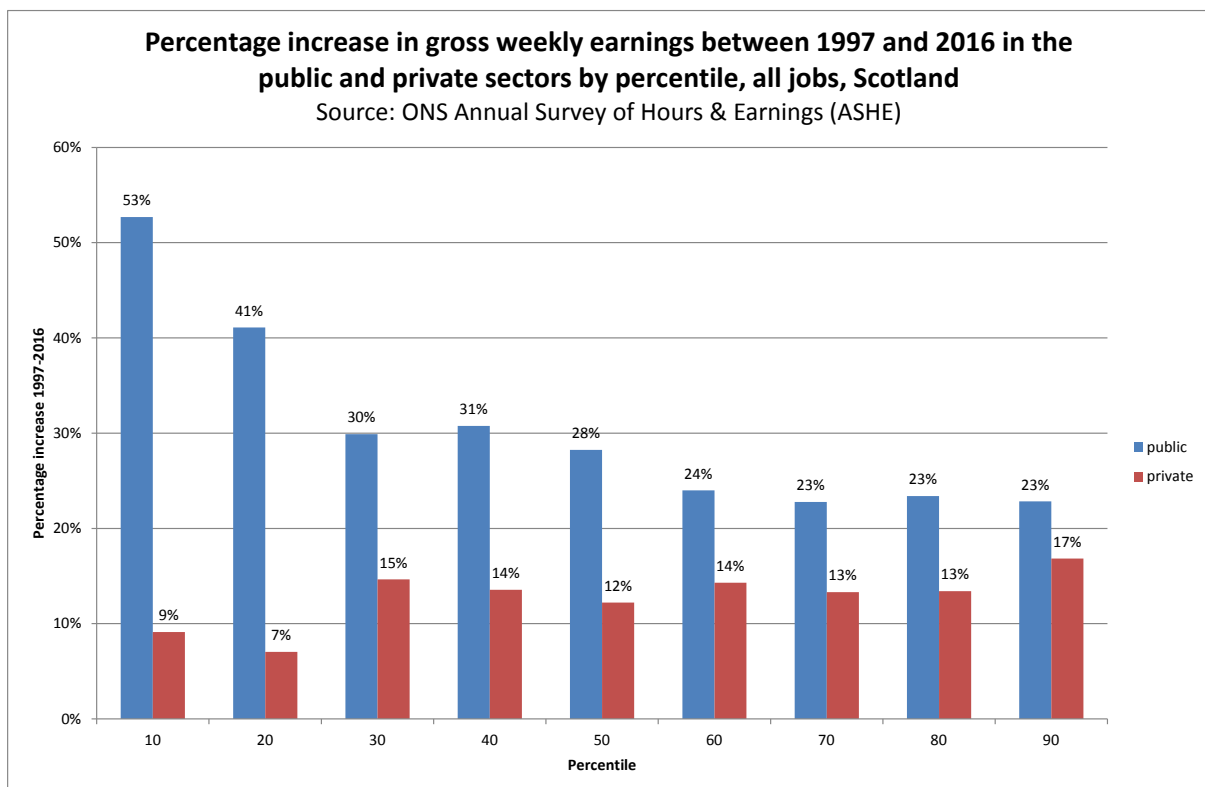
Similar trends are evident when the analysis is limited to full-time jobs only (data not shown). For part-time employment, the gap between the public and private sectors is notably wider (and has been widening for a longer time period). Trends for the four UK nations are shown in Figure 22 (note the different y-axis scales compared with those used in Figures 20-21).

Figure 22: Median gross weekly earnings (2016 prices), part-time jobs, by private and public sectors, four UK nations, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



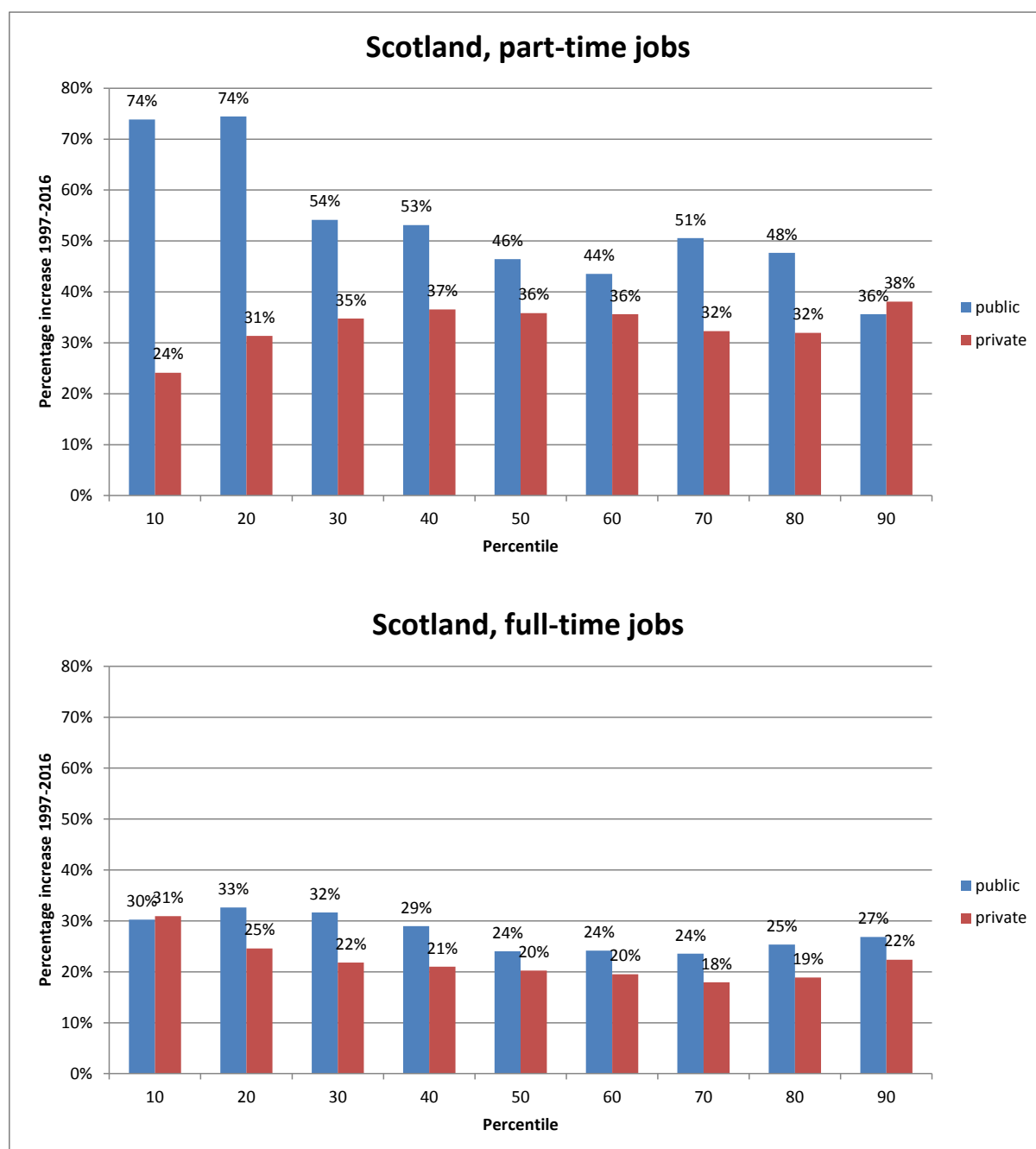
Different trends in earnings between the employment sectors have been observed not just in terms of median earnings, but also across the earnings distribution. Figure 23 shows, for all jobs in Scotland, the percentage increase in gross weekly earnings between 1997 and 2016 by percentile. Two opposing gradients are evident: in the public sector the greatest increases have been among the least well-paid, while in the private sector the opposite is true. A broadly similar pattern is evident in England and Wales (data not shown).

Figure 23.



As Figure 24 shows, this is driven more by increases among the least well-paid in part-time, rather than full-time, employment in the public sector – although even among full-time employees, increases were higher among the less well-paid (10th-30th percentiles) compared with the higher-paid (70th-90th percentiles).

Figure 24: Percentage increase in gross weekly earnings between 1997 and 2016 in the public and private sectors, part-time and full-time jobs, Scotland. Source: ONS Annual Survey of Hours & Earnings (ASHE).

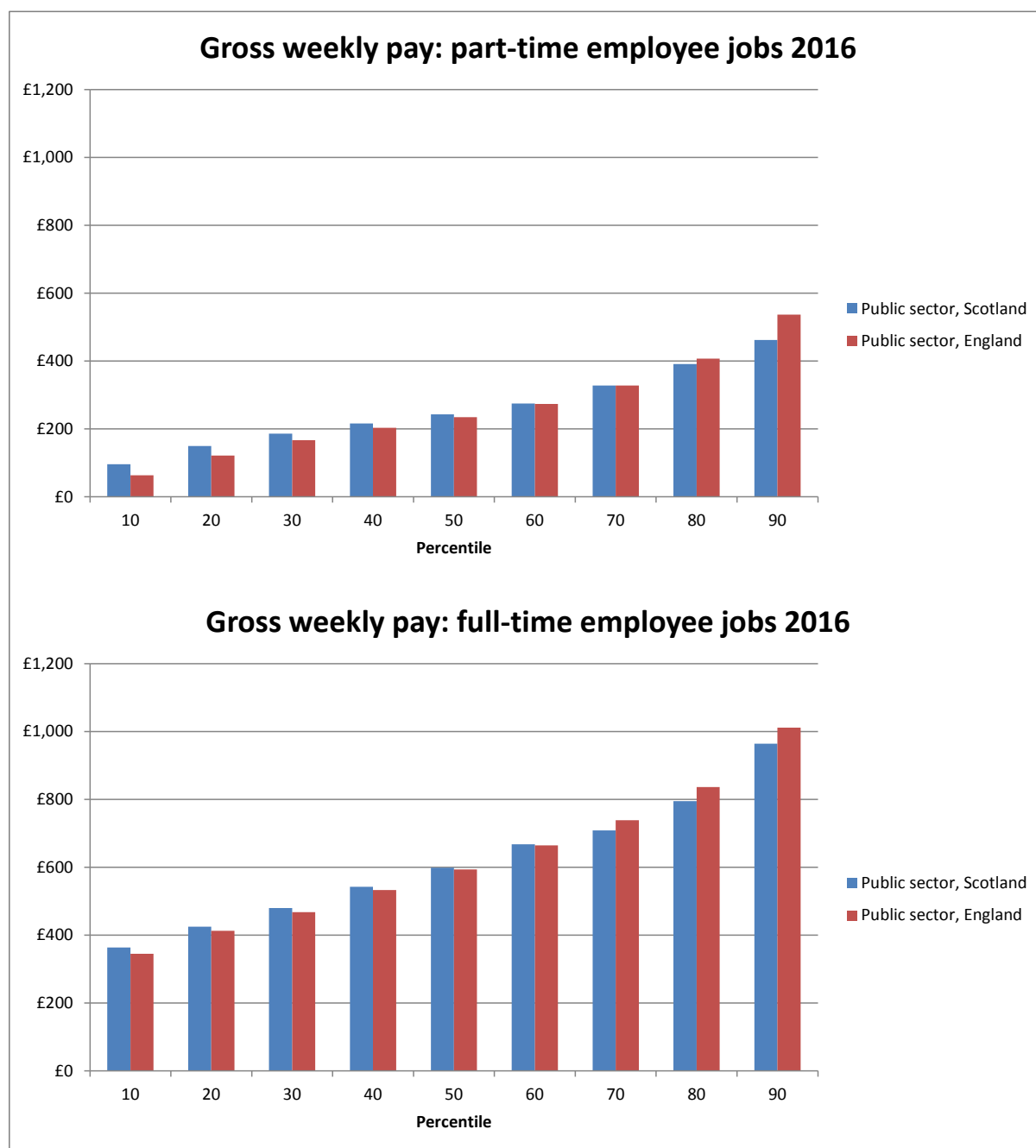


These changes over time have resulted in different levels of pay between the two sectors. For all jobs in 2016, all but the highest paid jobs were better remunerated in the public sector than in the private sector – with the differences greatest among the least well paid. This was generally true of both full-time and part-time jobs, although the differences were greater in comparison of the latter. These charts are included within Appendix A.

The analyses also highlight some subtle differences between earnings in the public sector in Scotland and those in England. In 2016, the earnings of lower paid jobs in the Scottish public sector (10th-40th percentiles) were slightly higher than the equivalent in the English public sector. This is true of

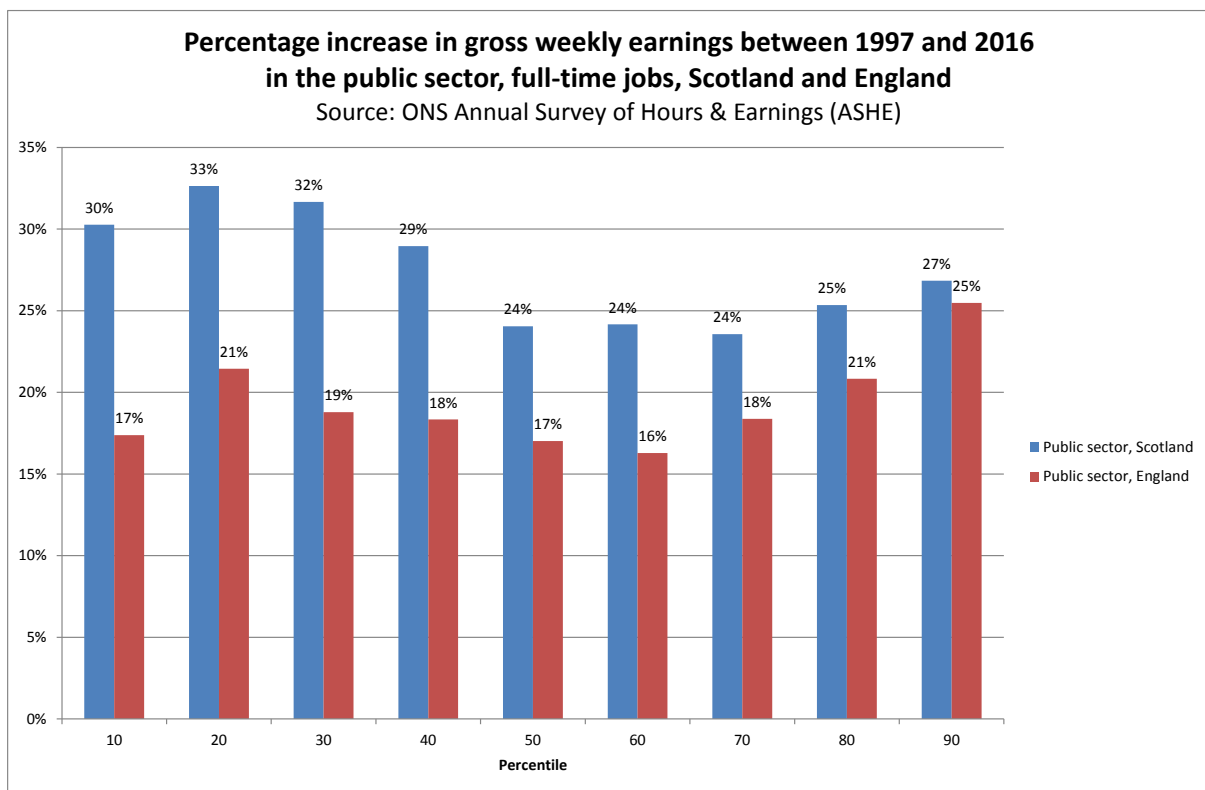
both full-time and part-time employment (Figure 25). However, while this was also the case for part-time jobs in 1997, it was not the case for full-time employment in that period: for full-time employment in the public sector this has been brought about by notably larger increases in the earnings of the less well-paid in Scotland over time (Figure 26)^x.

Figure 25: Gross weekly pay for part-time and full-time jobs in the public sector, by percentile, Scotland and England, 2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



^x Note that, in contrast, earnings in England in the private sector have been consistently higher in England across the whole earnings distribution, and this has been true of both full-time and part-time employment. However, for full-time jobs the gap has narrowed due to greater increases in earnings among the less well-paid in Scotland compared with England (something also observed in the public sector, as Figure B above shows).

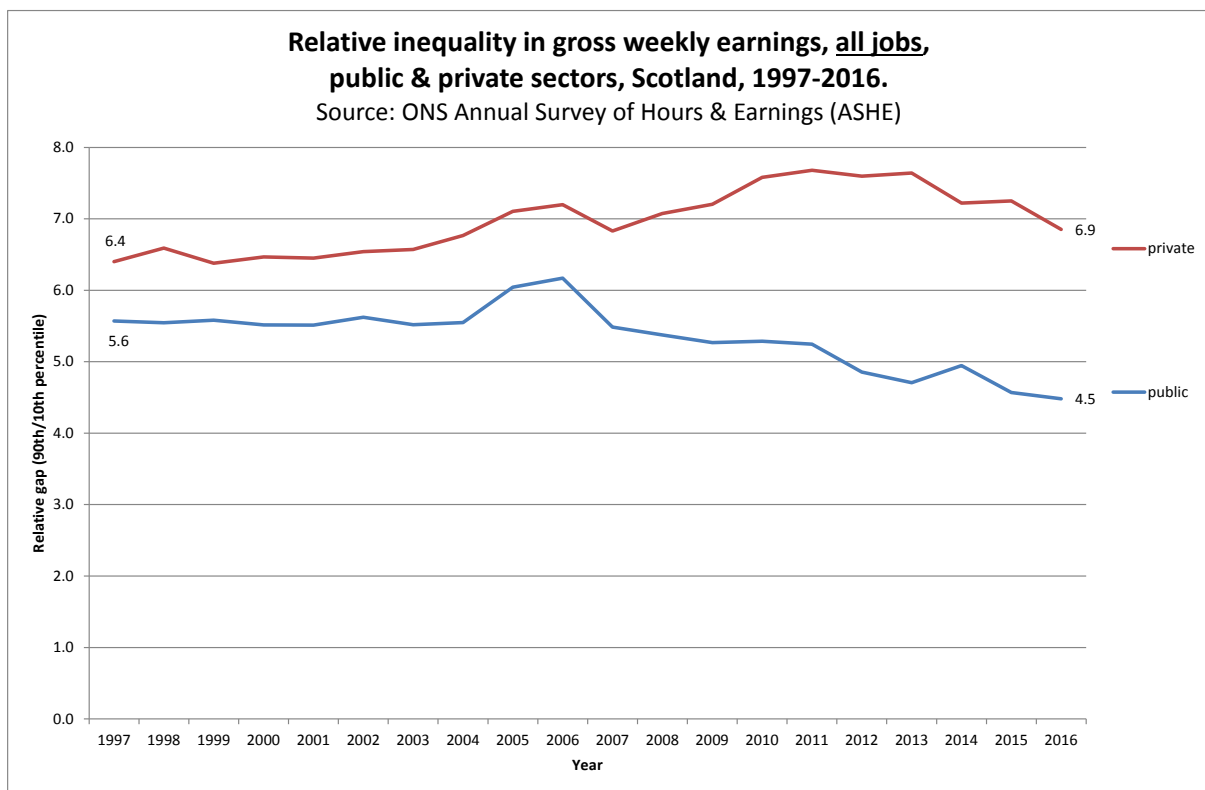
Figure 26.



(As Figure 25 also shows, it is also notable that public sector earnings among the *highest* paid jobs (80th and 90th percentiles) have been higher in England compared with Scotland).

What does all this mean for inequalities in earnings in the public and private sectors in Scotland and elsewhere? For all employee jobs, the trends in relative inequalities are moving in opposite directions in the two sectors: they are higher, and until very recently increasing, in the private sector; and lower, and decreasing, in the public sector. These, alongside trends by decile, are shown in Figure 27.

Figure 27.



A similar picture is observed elsewhere in England and Wales. However, inequalities are wider in England than Scotland in both sectors e.g. in the public sector in 2016 the figures were 4.5 in Scotland and 5.3 in England (latter data not shown).

Equivalent data for full-time jobs only are shown in Figure 28: relative inequalities have been consistently higher in the private sector over the period of analyses, although they have fallen slightly in both sectors since around 2010.

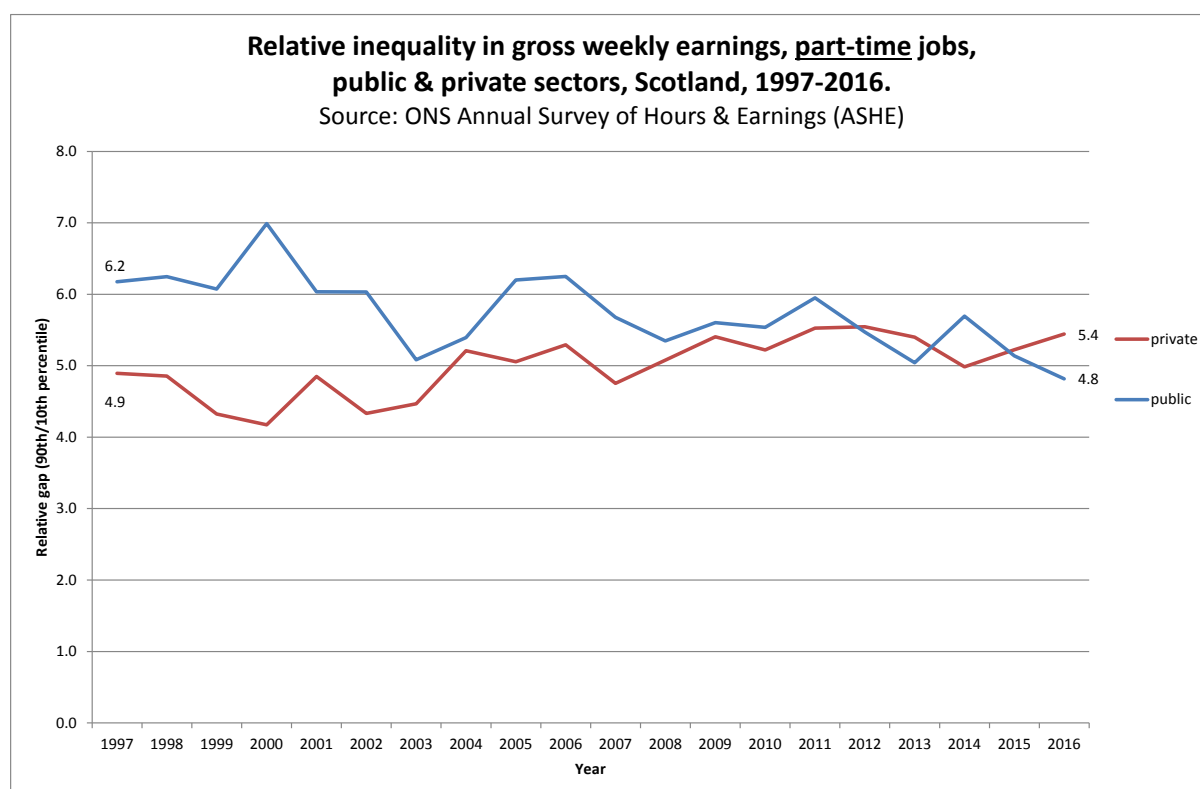
Figure 28.



Again, similar trends have been observed elsewhere in the UK; relative inequalities are slightly higher in England (data not shown).

For part-time employee jobs, contrasting trends between the two sectors are again evident: falling relative inequalities in the public sector and rising inequalities in the private sector. These are shown in Figure 29. This trend in relative inequalities in Scotland is slightly different than the trend in England where there has been a less marked decrease in inequalities in the public sector (data not shown).

Figure 29.



Trends in *absolute* inequalities generally show the same pattern observed with all, full-time and part-time jobs shown earlier (Figures 9 & 12) i.e. increasing until around 2010 and then subsequently decreasing. Absolute inequalities have been consistently higher in the private sector for all jobs and full-time jobs, but higher in the public sector for part-time earnings (where there is a much wider distribution of earnings, as seen above in Figure 12). These charts are not shown here.

5. Low pay

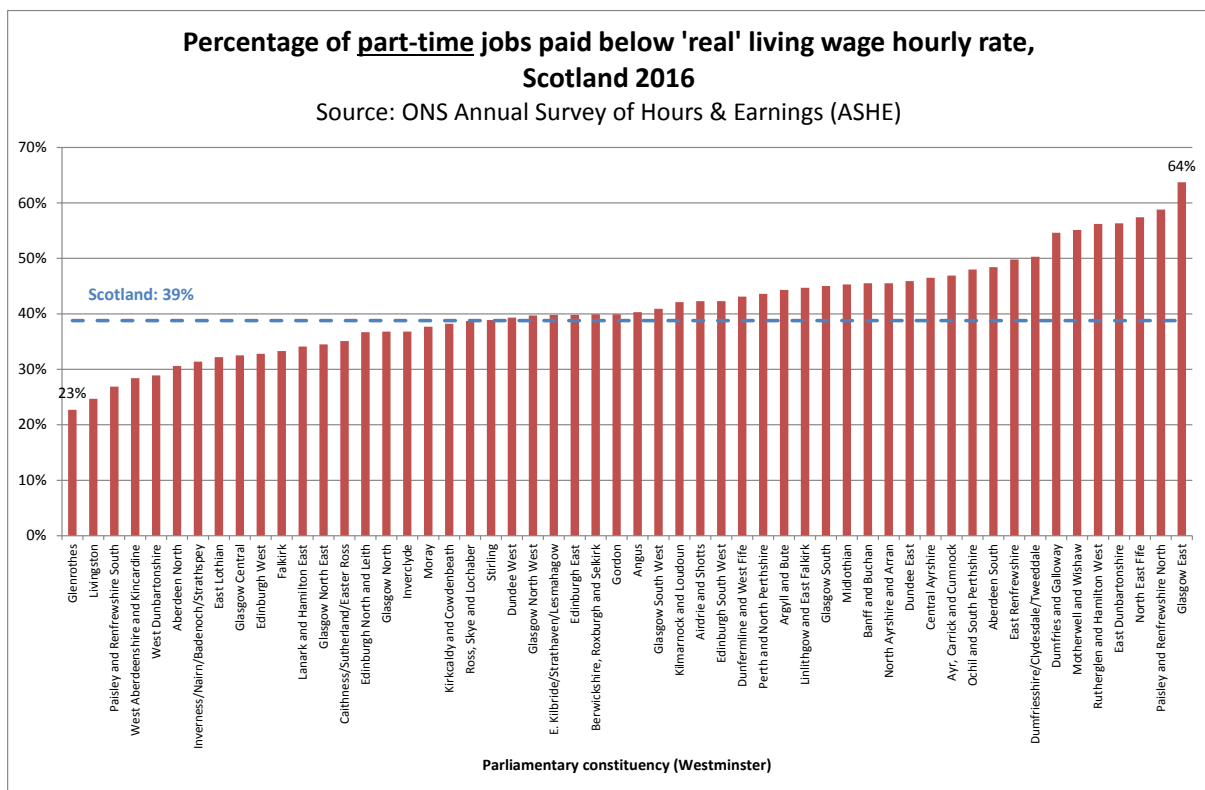
This section looks at two related aspects of low earnings: the ‘real’ living wage (RLW) (as defined by the Living Wage Foundation), and the UK government’s defined ‘living wage’ (in effect, the minimum wage).

As stated in the Methods section, in 2016 the RLW was set as £8.25 per hour (for those working outside London)^{xi}. In that year one fifth (20%) of employees in Scotland earned less than that amount. As Figure 30 shows, however, the figure varied considerably across different parts of Scotland: across different parliamentary constituency areas the percentage of employees earning less than the RLW ranged from 12% in Edinburgh West to 33% in Dumfries & Galloway^{xii}. It should be emphasised, however, that at this level of disaggregation, not all of the differences between particular areas will be statistically ‘significant’ and should be interpreted with caution.

^{xi} For those working in London, the figure was £9.40 per hour.

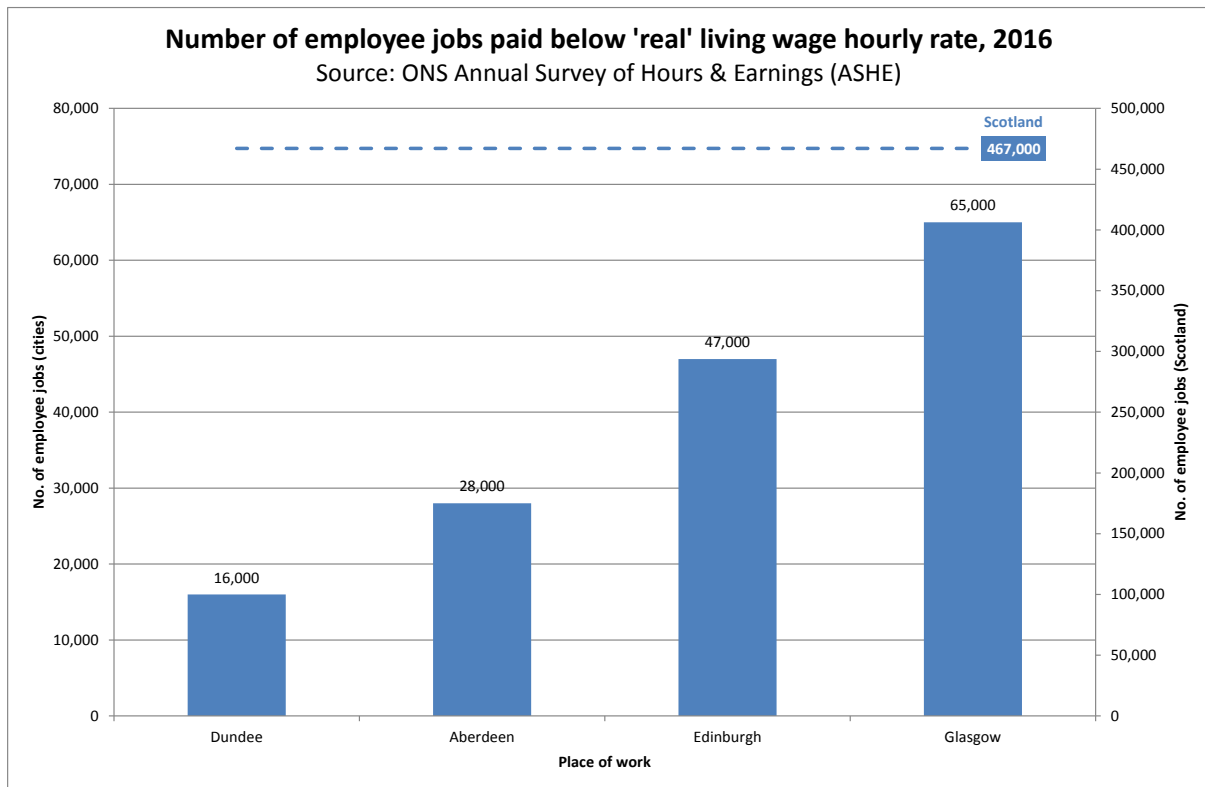
^{xii} The figures for some constituencies may be influenced by the presence of – for example – large public-sector employers.

Figure 31.



In terms of absolute numbers, these figures (for all jobs, not just part-time employment) mean that in 2016 almost half a million people in Scotland earned under the RLW. As Figure 32 shows (highlighting data for the cities rather than parliamentary constituencies), 65,000 of those were based in Glasgow (18% of all jobs in the city).

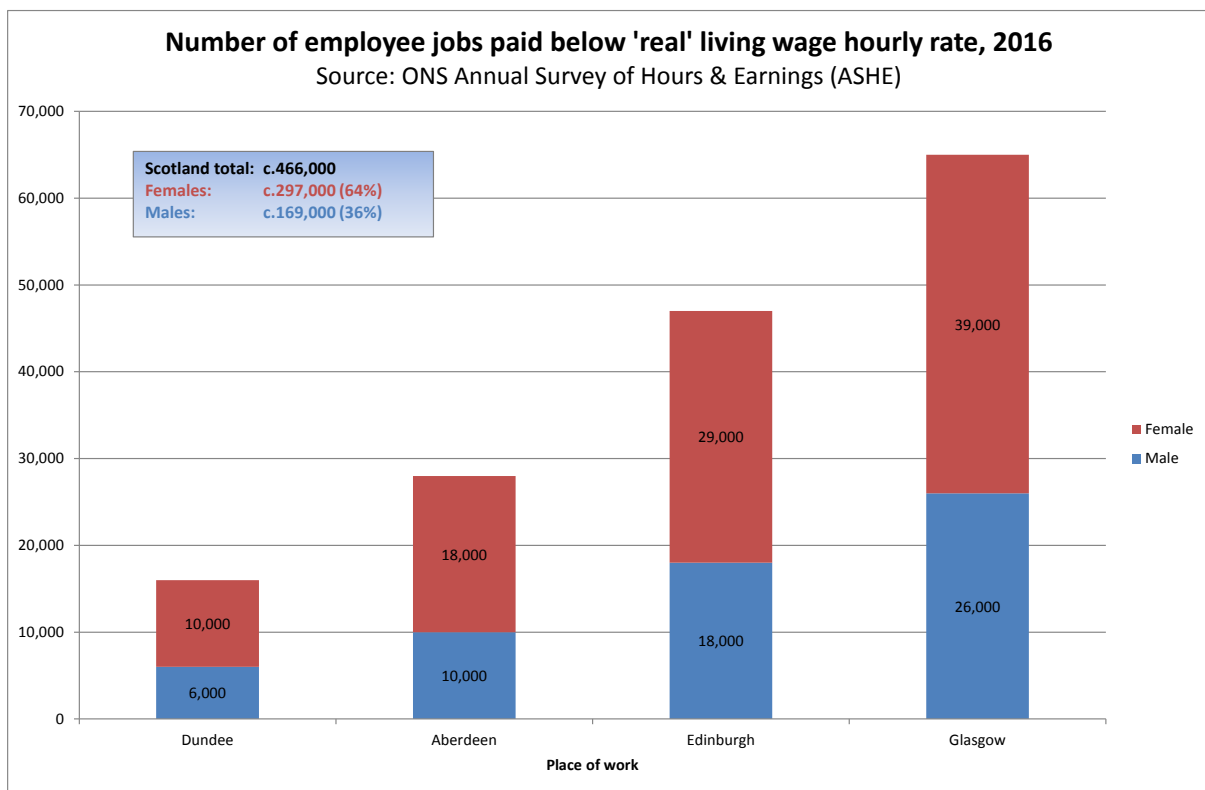
Figure 32.



Gender inequalities are discussed in more detail in the next section of the report, but it is worth noting here that the majority of these low-paid jobs are held by women. The absolute numbers are shown in Figure 33. In Scotland as a whole in 2016, 64% of employees paid below the RLW were female. The proportions in the cities were very similar^{xiii}.

^{xiii} 60% in Glasgow, 62% in Edinburgh, 63% in Dundee, and 64% in Aberdeen.

Figure 33.



How do the Scottish figures presented above compare with elsewhere in the UK? Figure 34 shows that in 2016 the overall figure for Scotland (20%) was actually lower than the figures for the other UK nations. Across the selected UK cities the figures ranged from 16% in Edinburgh to 23% in Liverpool. Among part-time employees, the proportion paid below the RLW was considerably higher: Figure 35 shows that in 2016 the percentage of part-time employees paid below the RLW hourly rate ranged from 32% in Bristol to 49% in Liverpool.

Figure 34.

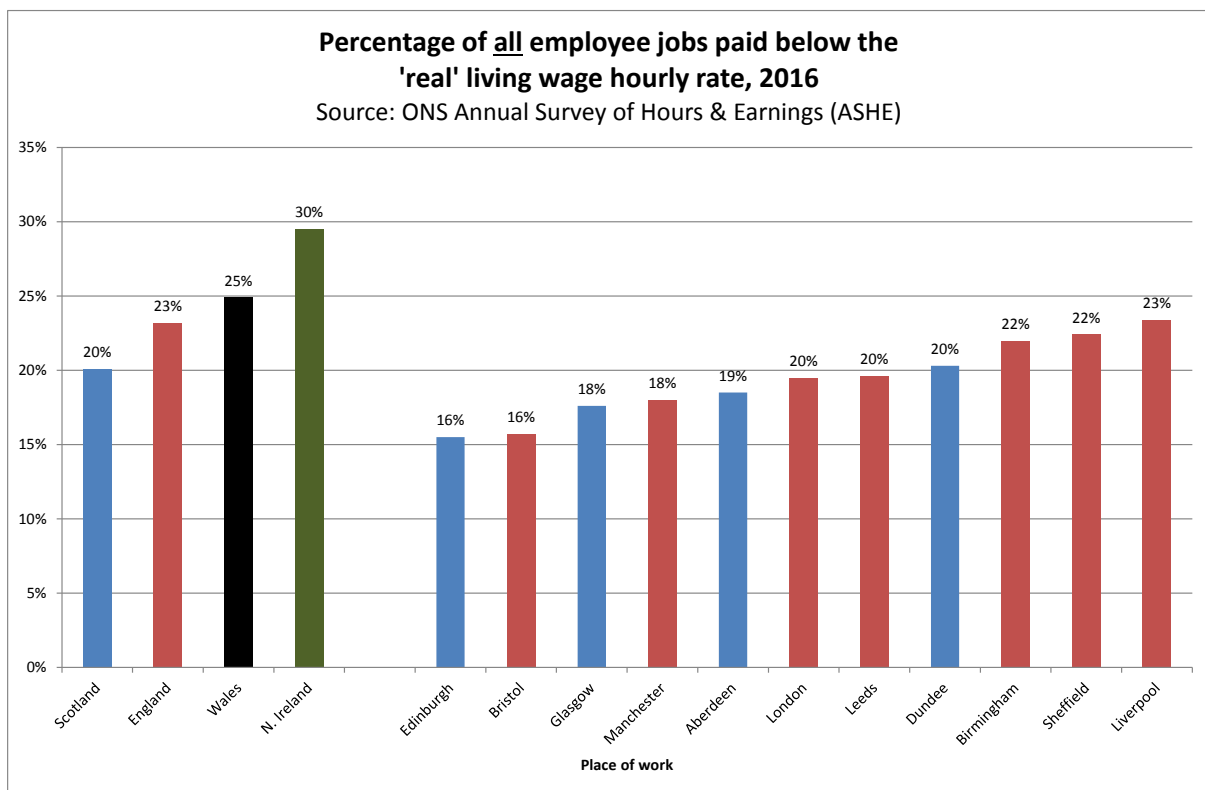
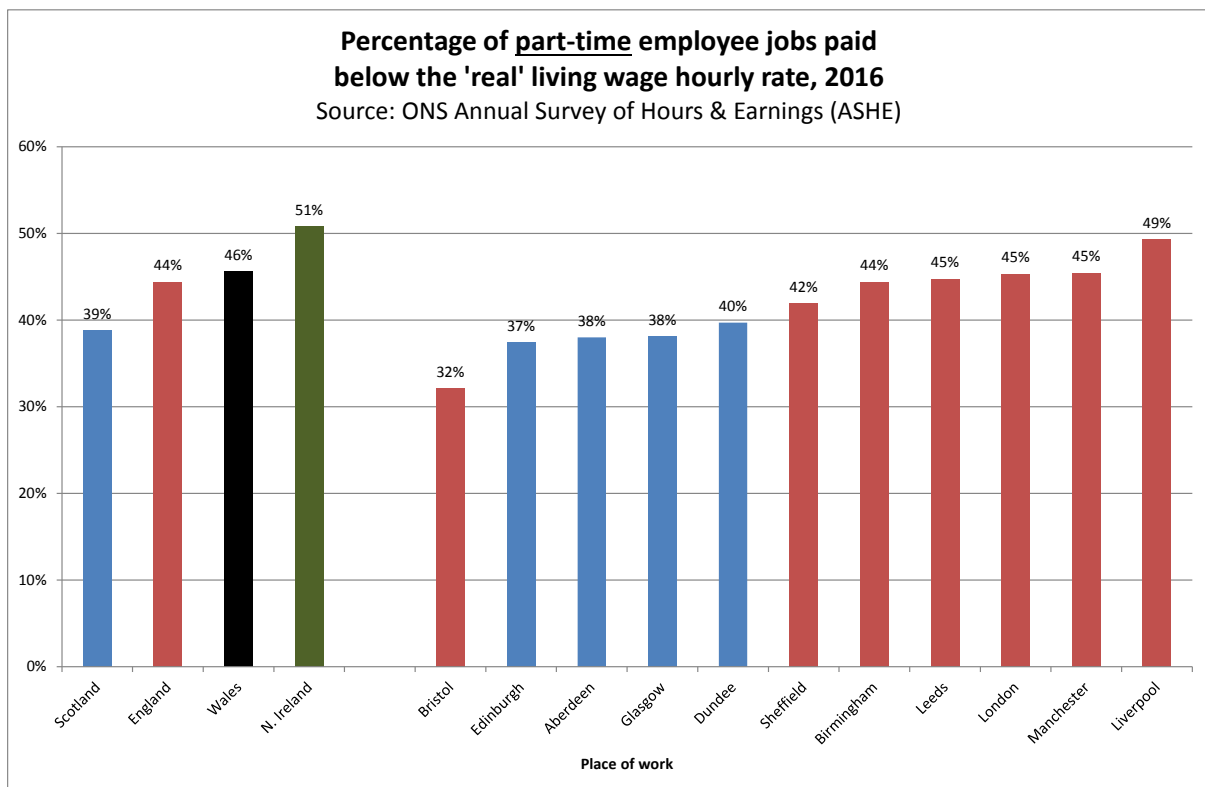


Figure 35.



Since these data were analysed, more recent figures for 2017 have become available. The more recent data show that the percentages of employees earning below the RLW remain high, but that

there were modest improvements, particularly in Scotland. As Figures 36 and 37 show, the percentage of all employee jobs earning less than the RLW fell from 20% to 18% in Scotland, from 18% to 15% in Glasgow. The equivalent decreases for part-time employment were 39% to 36% (Scotland) and 38% to 32% (Glasgow). Figures 36 and 37 also show much greater decreases occurred in Dundee, while decreases were generally smaller in England. However, it is important to emphasise that data can fluctuate considerably on a year to year basis, and thus it is difficult to read too much into a comparison of only two time points.

Figure 36.

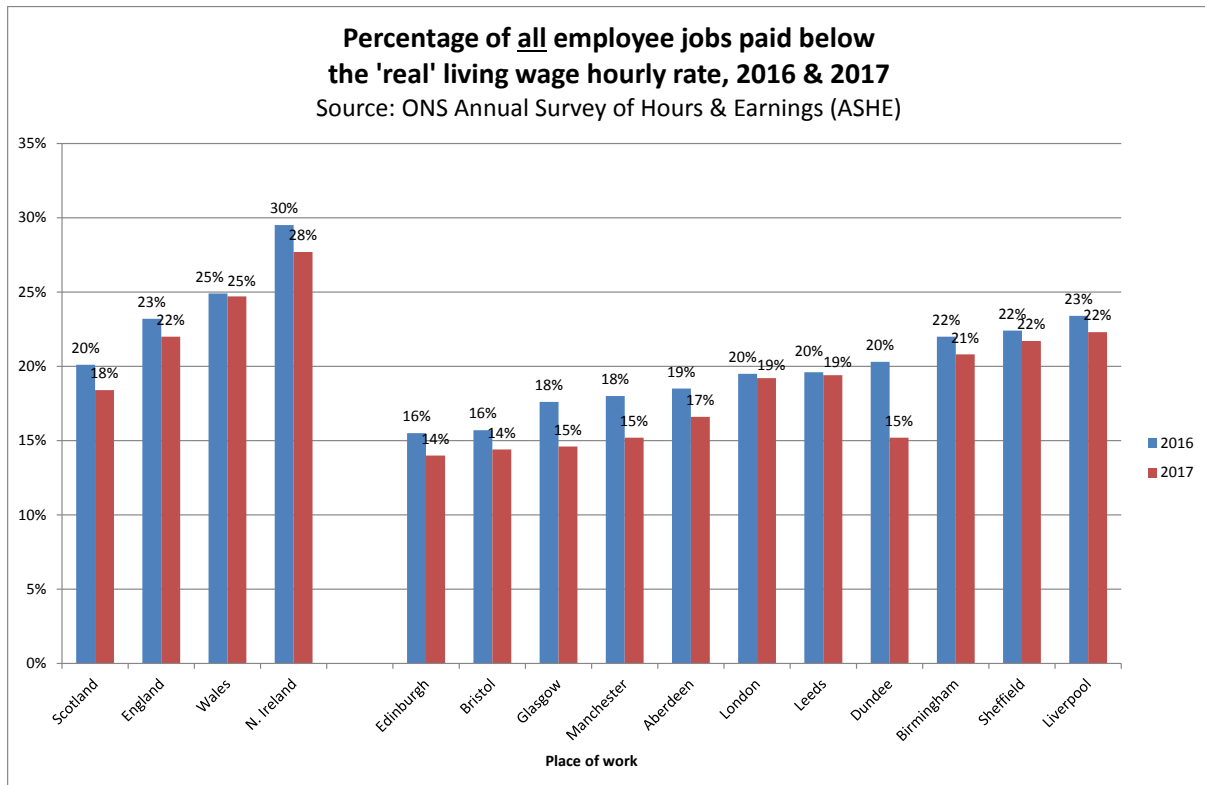
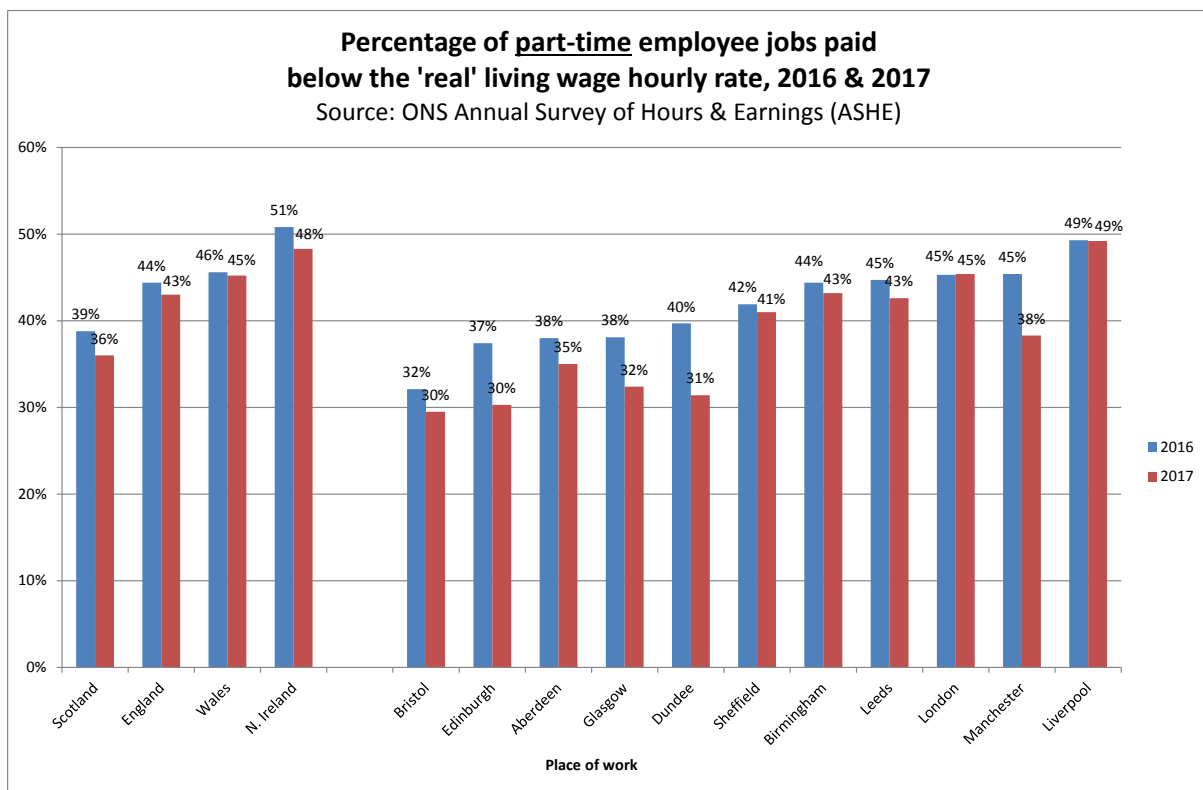


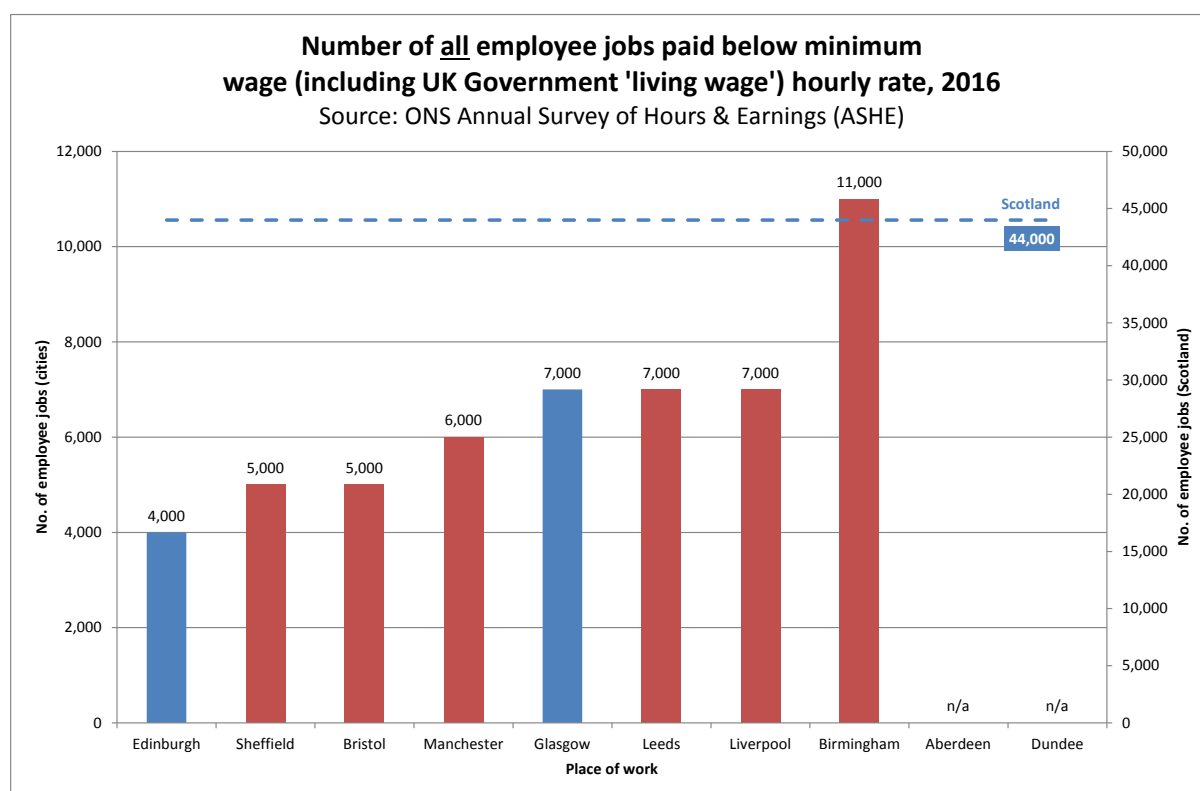
Figure 37.



The UK government’s definition of a ‘living wage’ (effectively, the minimum wage) was described in detail in the Methods section. It was made mandatory on 1st April 2016. Figure 38 shows that in that year^{xiv}, approximately 44,000 employees in Scotland were paid below this level, including approximately 7,000 in Glasgow (just under 2% of all employee jobs in the city). Note that figures for Aberdeen and Dundee were not available.

^{xiv} Note that the ASHE data shown in Figure 38 above are based on data collected in April 2016 (the month when the new minimum wage levels were introduced). The totals include some jobs the pay rate for which had been set prior to the new minimum wage legislation being implemented. Data show that by 2017 the figure for Scotland had reduced from 44,000 to approximately 26,000 (just over 1% of all employee jobs). Note, however, that the figures shown in Figure 38 are still an accurate representation of the number of jobs paid below the level of the minimum wage as at April 2016.

Figure 38.



As with the RLW analysis, the majority of these employees are women. This is shown in the section below which discusses gender inequalities.

6. Gender inequalities

6.1 Overview

Some of the broader issues relating to gender inequalities in earnings are highlighted in the Discussion section of this report. In this section we focus on what the data tell us about recent trends in different measures of gender inequality.

Note: the focus of most of the analyses presented in this report is gross weekly earnings. For the purposes of this report, this is a preferable measure to hourly earnings, as the latter does not give any insight into likely levels of take-home pay (as that obviously depends on the numbers of hours worked). Nonetheless, hourly pay is used as the basis for 'official' statistical monitoring of gender pay inequality in Scotland and the UK²⁵⁻²⁸. For this reason, the section below includes some additional comparisons of inequalities based on weekly and hourly earnings.

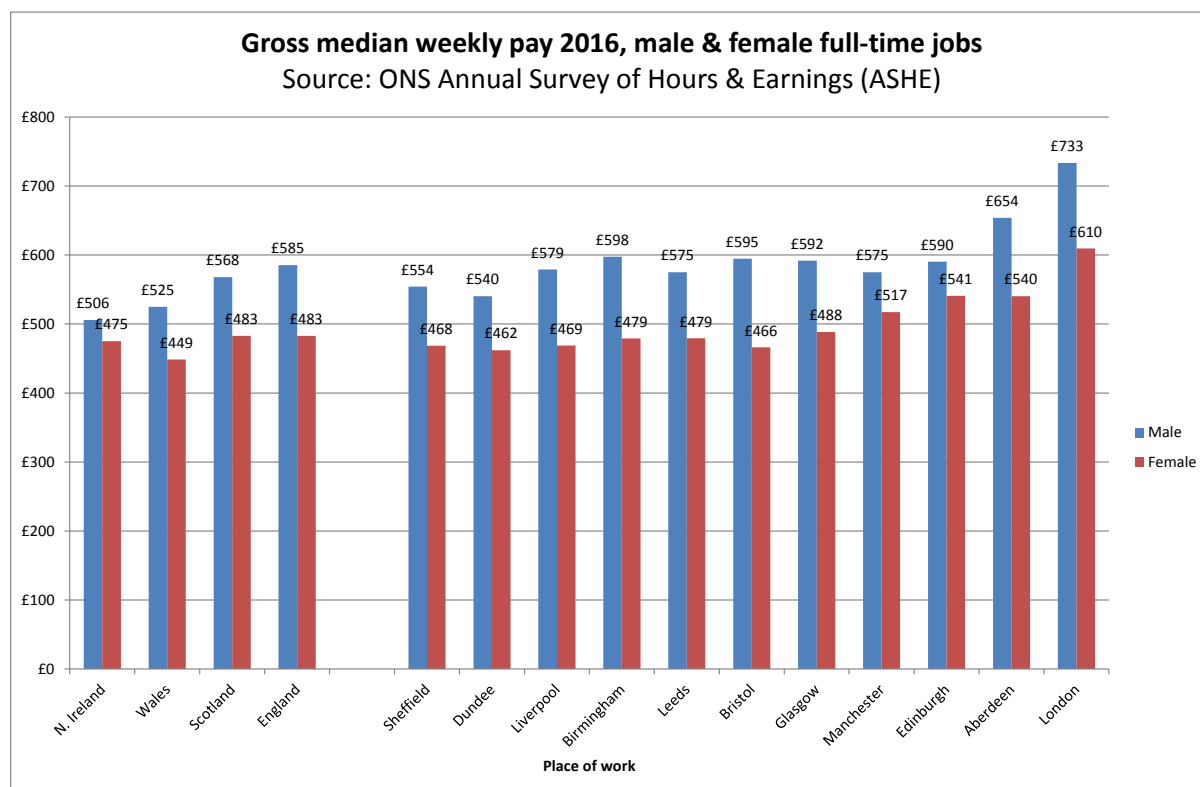
The official measure of gender inequality in pay is also based on full-time earnings only. This is for reasons of comparability since almost 80% of part-time jobs in Scotland (and in the rest of the UK) are held by women, thereby skewing any comparison of wage levels between men and women across all employee jobs. For that reason, most of this part of the report also concentrates on differences in full-time earnings. However, it is also recognised that an important cause of gender inequality in pay relates to caring responsibilities which disproportionately affect women, and which

impact on the numbers of hours worked. In the section below, therefore, we additionally include comparisons of inequalities in earnings for *all* employee jobs^{xv}.

6.2 All, full-time and part-time jobs

Figure 39 shows that in 2016 the median weekly full-time earnings of men were notably higher than those of women across all countries and cities included in the analyses. In relative terms, full-time earnings for men in 2016 were 18% and 21% higher in Scotland and England respectively. As Figure 40 – comparing the percentage difference between male and female full-time earnings in 1997 with 2016 – shows, however, those relative differences have decreased considerably over the period of analysis. For example, in 1997 male earnings were 38% higher in Scotland and 34% higher in England. Figure 40 also shows that at the national level the gap was lowest in Northern Ireland (6%), while among the cities the relative gap was lowest in Edinburgh (having fallen from 36% higher to 9% higher). Notable decreases in the size of the gap were also seen in Liverpool (from 45% to 23%) and Aberdeen (from 52% to 21%). However, reductions were observed everywhere.

Figure 39.



^{xv} It is also worth noting that ‘official’ measures of the gender gap in pay also exclude overtime: as men work relatively more overtime it is argued that its inclusion would skew the results. This again does not take into account potential underlying reasons of *why* women may work less overtime than men.

Figure 40.

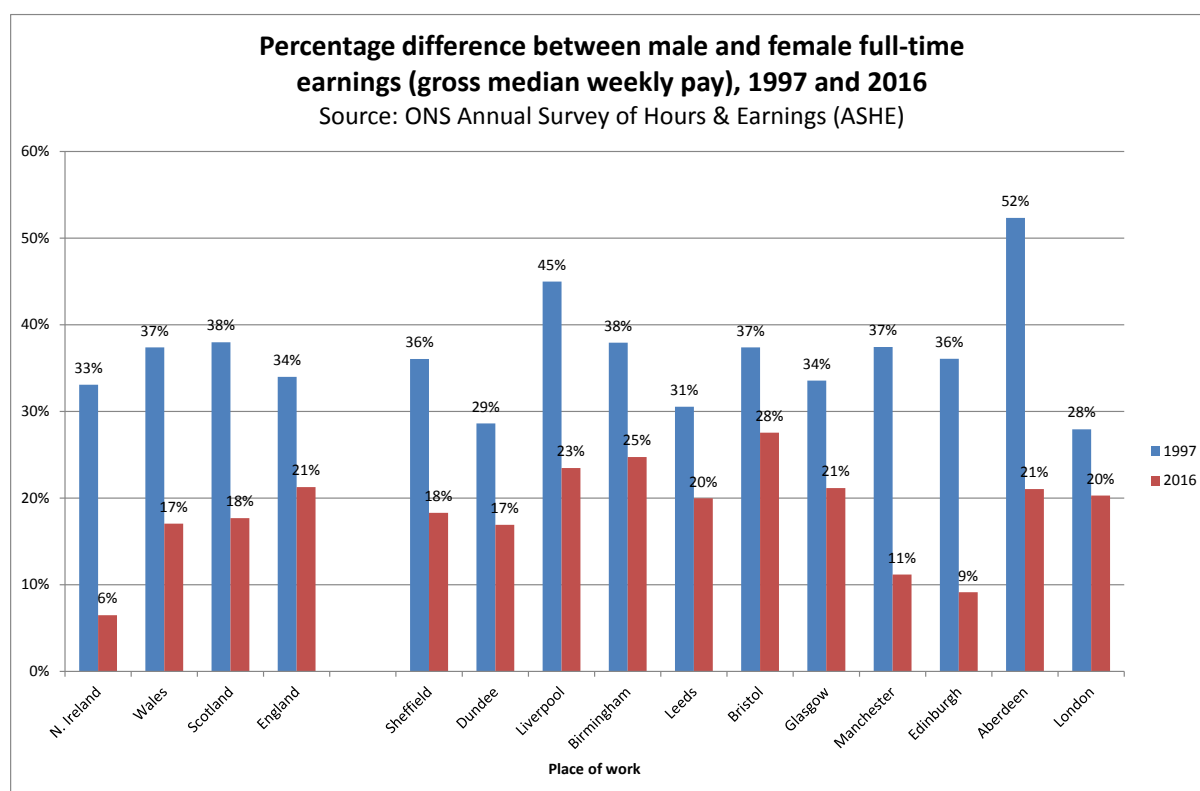


Figure 40 above shows differences in *median* earnings between men and women. However, the size of the gap between men and women varies considerably across the broader earnings distribution, with the gap tending to be greater at the higher earnings end of that distribution. This can be seen in Figure 41 which shows, by percentile, the percentage difference between male and female full-time weekly earnings in both 1997 and 2016 in each of the four UK countries. The observed pattern is generally similar in Scotland and England; in Wales there was much less difference across the earnings spectrum in 2016, while in Northern Ireland, the greatest difference in 2016 was in the comparison of the highest paid (90th percentile). This more pronounced gap between higher earning men and women tends to be more apparent within the more unequal cities e.g. London, Aberdeen and Edinburgh. Using a different axis scale, Figure 42 presents similar data to that shown in Figure 41 above for those three cities and Glasgow.

Figure 41: Percentage difference in male and female gross full-time weekly earnings, four UK nations, 1997 and 2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).

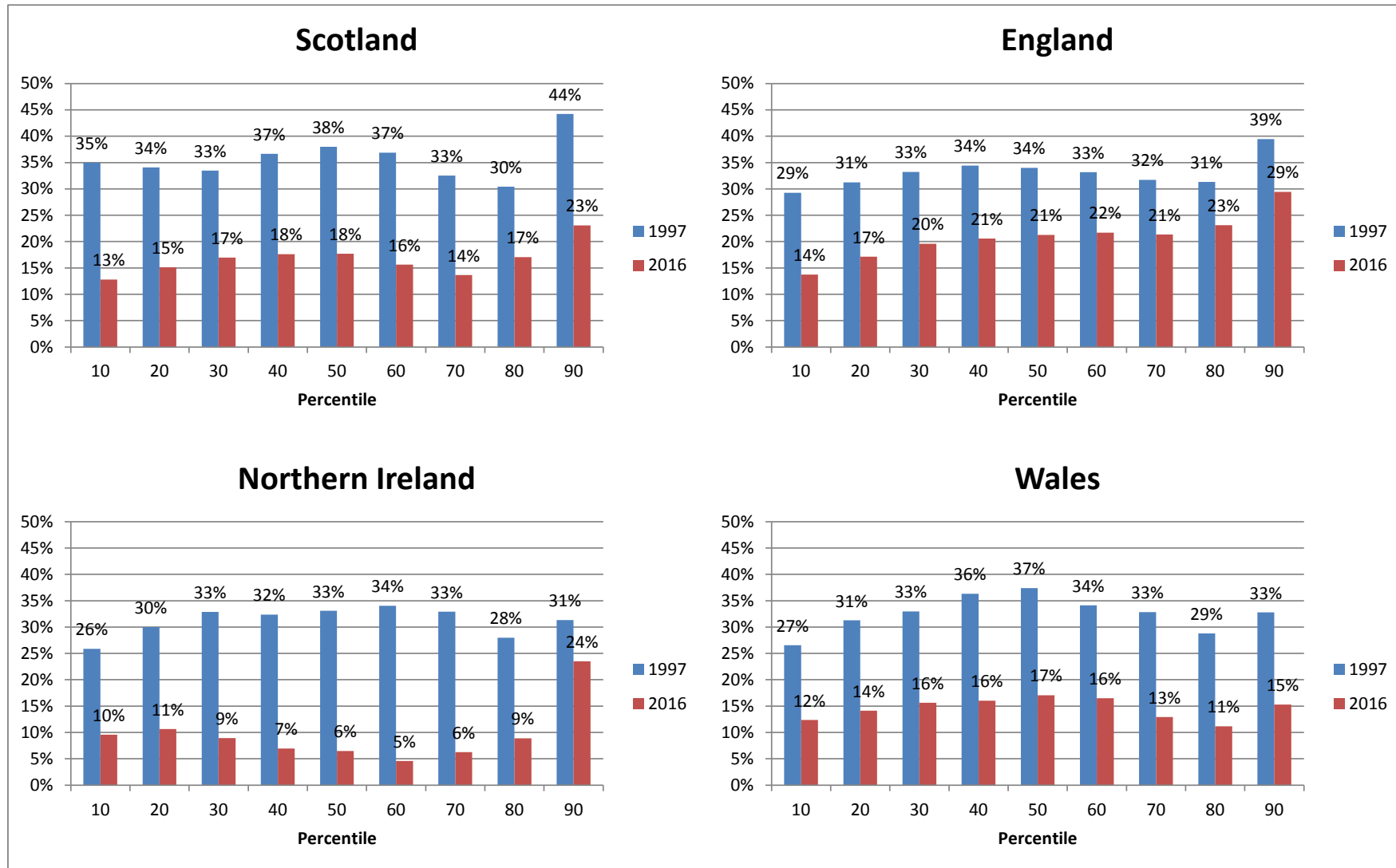


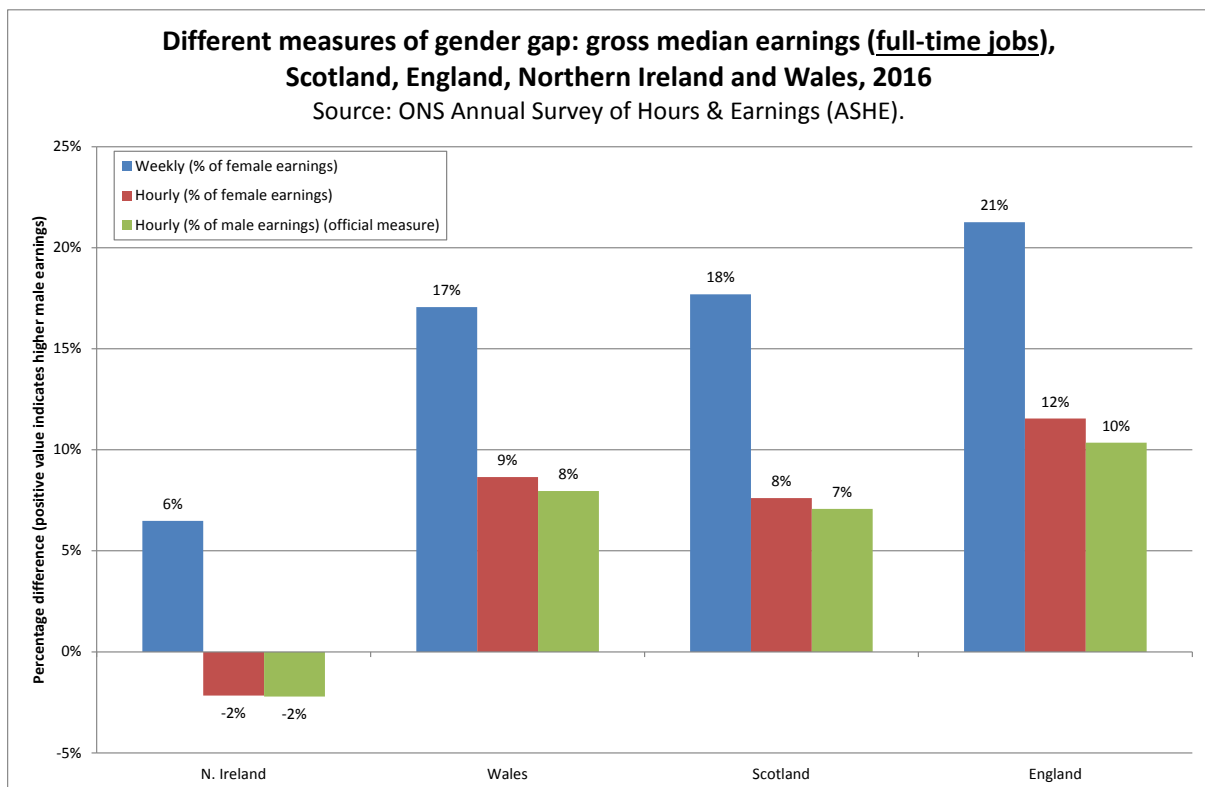
Figure 42: Percentage difference in male and female gross full-time weekly earnings, four UK cities, 1997 and 2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



Returning to the gender differences in median full-time pay shown in Figure 40, the figure for Scotland in 2016 of 18% higher male pay is considerably greater than 'official' gender pay gap reported in national monitoring publications. This is for two reasons: first (and most importantly) because of the difference that results from calculating the gap based on hourly, rather than weekly, earnings; in addition, there is a difference in terms of how this gap is expressed as a percentage. The charts above show, in percentage terms, how much higher male earnings are compared with female earnings: thus the difference is shown as a percentage of female earnings. In the 'official' measure, the gap is shown as a percentage of male earnings, which has the result of reducing the gap slightly more^{xvi}.

Figure 43 compares these three measures of gender inequality for full-time earnings i.e. based on weekly earnings, hourly earnings (expressed as a percentage of female earnings) and the 'official' hourly earnings measure (expressed as a percentage of male earnings). It is notable that the figure for Scotland falls from 18% higher male earnings (weekly) to 8% and 7% (hourly). Gender inequalities (in the sense of lower earnings among women) in Northern Ireland are effectively eradicated using the hourly measures.

Figure 43.

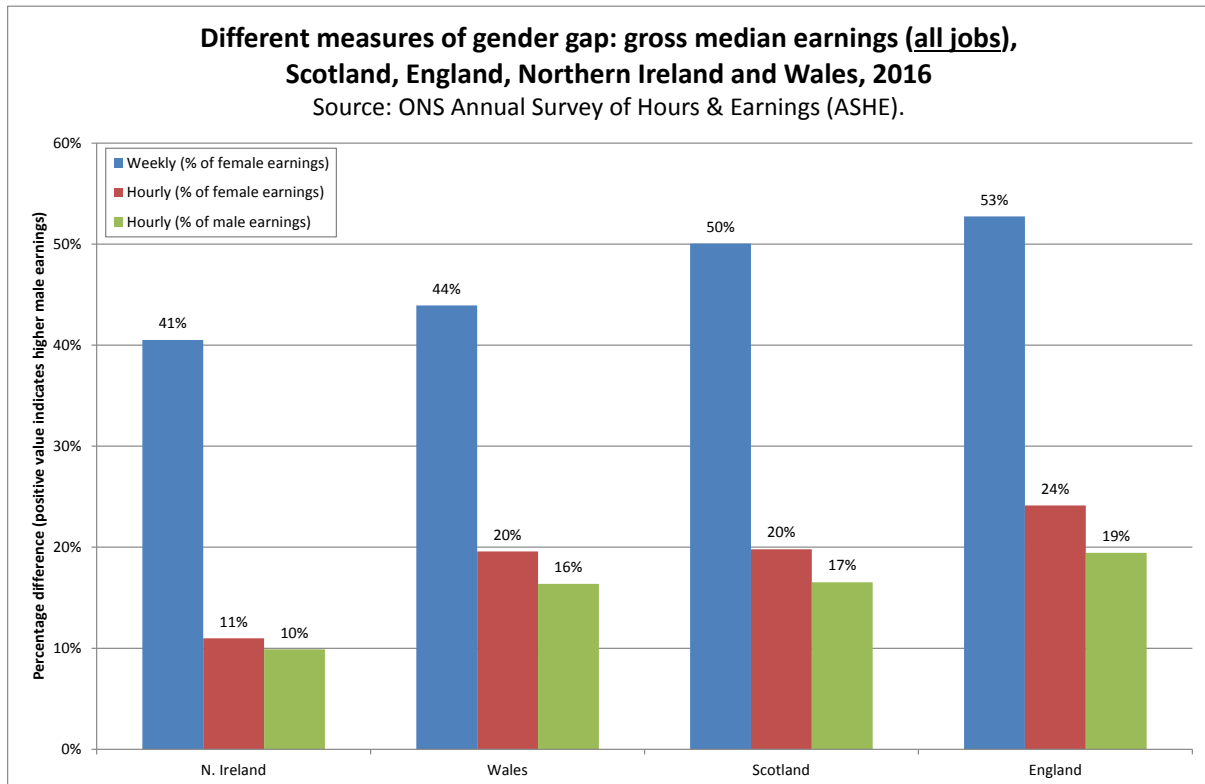


An examination of gender earnings inequalities in *all* employee jobs highlights an even more dramatic impact of the use of different statistical measures. As stated above, an assessment based

^{xvi} As an illustrative example: if a man earns £10 per hour and a woman £5 per hour, then the male earnings are twice (100%) as much as the female earnings. This is calculated as the difference (£10-£5 = £5) divided by the female earnings, multiplied by 100 i.e. $\frac{£10-£5}{£5} \times 100 = 100\%$. However, in the official estimate which is shown as a percentage of male earnings the figure is instead 50% i.e. $\frac{£10-£5}{£10} \times 100 = 50\%$.

on all employee jobs (full-time and part-time) is important because of the way women’s hours of employment can be disproportionately affected by other (e.g. family) commitments. Figure 44 shows the same three measures of gender inequality as shown above, but for all employee jobs. This shows that in Scotland in 2016 male weekly earnings were 50% higher than female weekly earnings. The use of hourly earnings reduces that figure to 20% and 17%.

Figure 44.



The difference between gender wage inequality based on weekly earnings and that based on hourly earnings clearly relates to the number of hours worked. For example, for all employee jobs in Scotland in 2016 the median number of hours worked was 37.5 hours per week for men and 34.5 hours per week for women. Looking at the broader distribution of numbers of hours worked, the range (from 10th to 90th percentile) was 25 to 46 hours for men, and 13 to 40 hours for women. These data are shown in Table 1 below.

Table 1. Median, 10th percentile and 90th percentile values for number of hours worked, males and females, Scotland 2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).

	Gender	Number of hours worked		
		Median	10th percentile	90th percentile
All jobs	Male	37.5	25.0	46.0
	Female	34.5	13.4	40.0
Full time	Male	38.6	35.0	47.0
	Female	37.0	33.5	40.8
Part time	Male	18.1	5.4	29.8
	Female	20.0	7.5	29.0

A different aspect of gender inequality in earnings emerges from an analysis of part-time earnings: for these, male earnings are generally *lower* than female earnings. As Figure 45 shows, this is true, irrespective of which of the three measures is used^{xvii}. Figure 46 below also shows that the number of men working part-time (as a percentage of all part-time jobs in Scotland) has increased over the past 20 years. The implications of these, and all the figures presented here, are discussed later in the report.

^{xvii} It is also apparent that for weekly part-time earnings, the lower earnings among men will relate in part to the fewer number of hours worked on average (as Table 1 shows).

Figure 45.

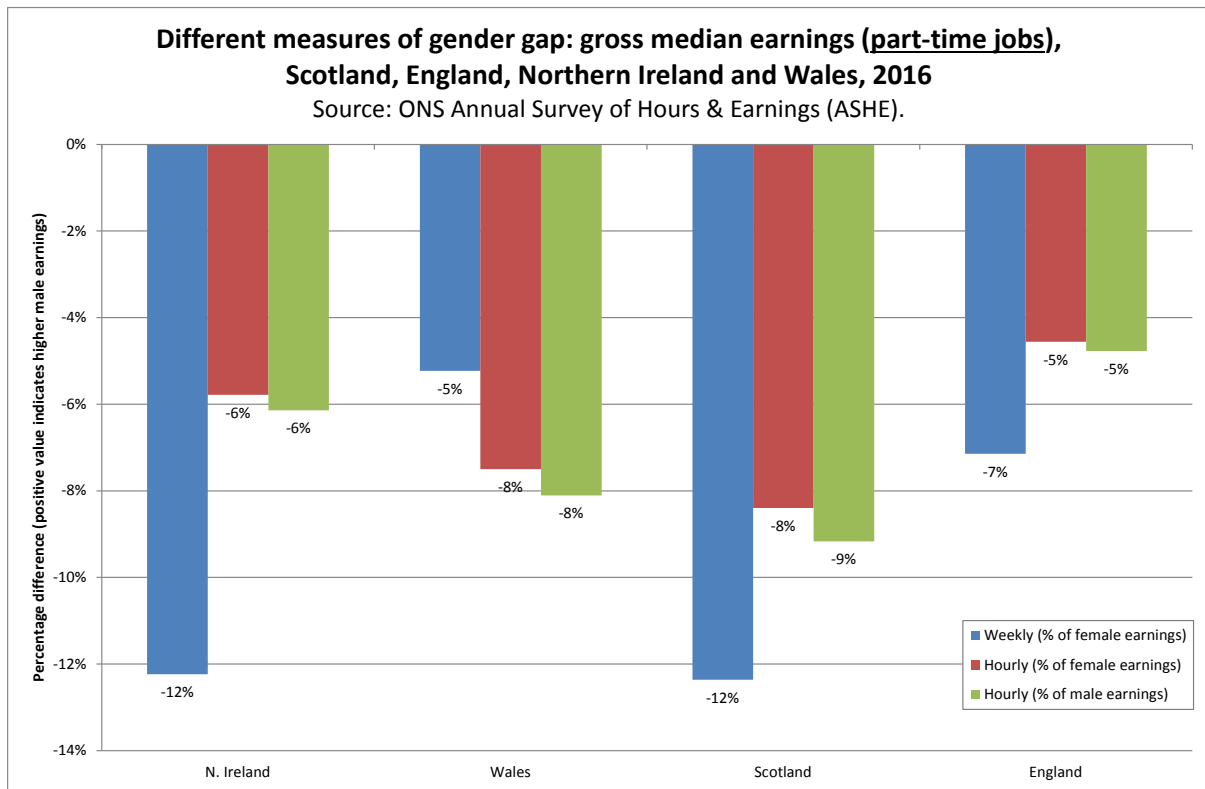
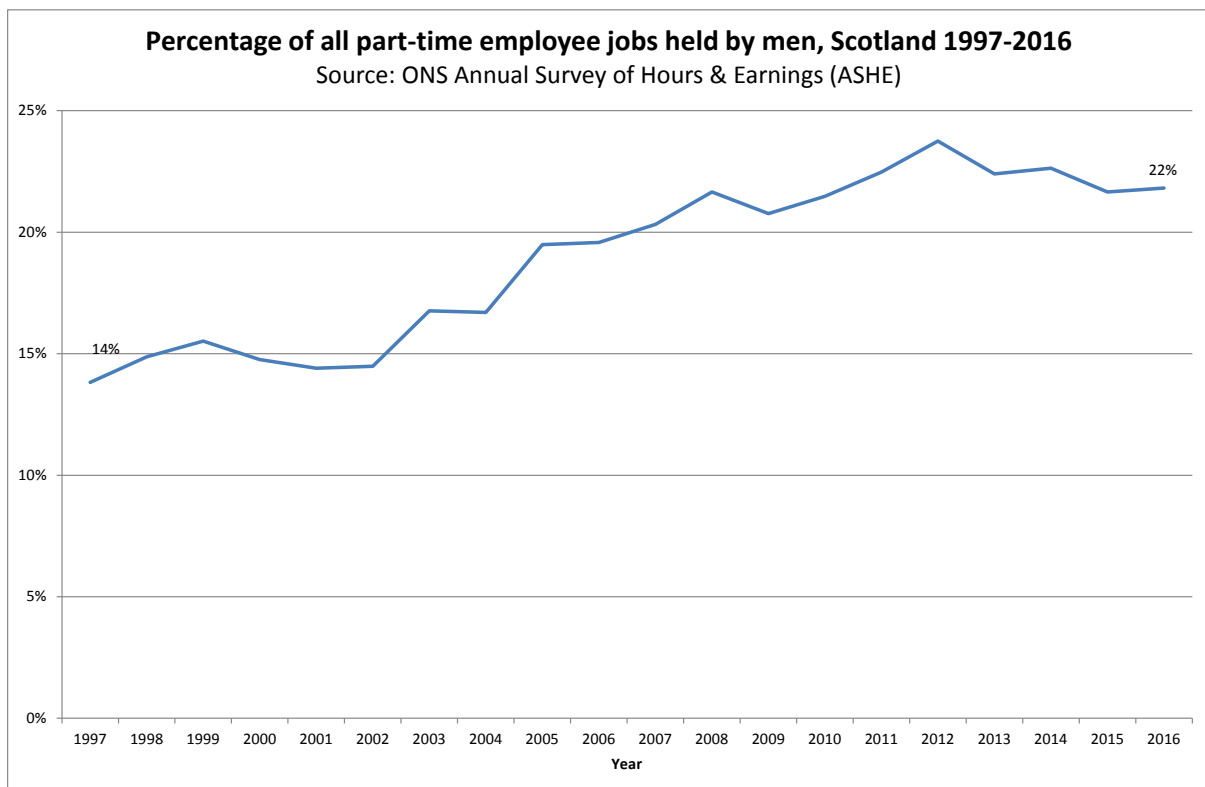


Figure 46.



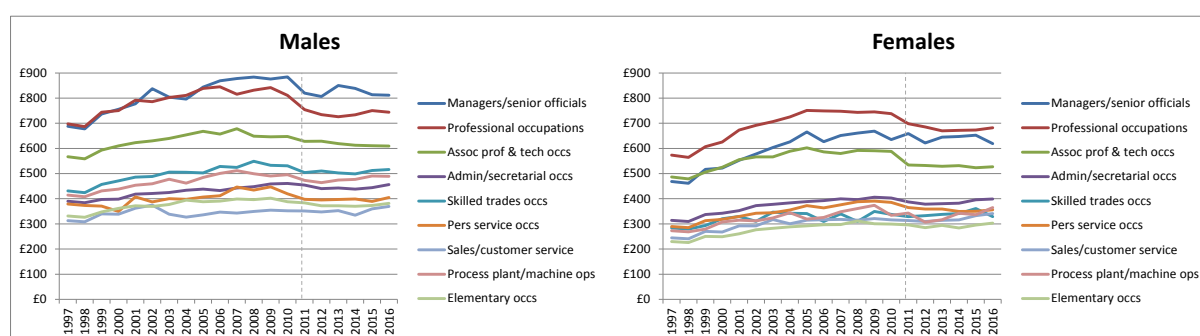
The remainder of this section focuses on the gender gap in relation to *weekly full-time* earnings.

6.3 Occupation

Unsurprisingly, given what has been shown above in terms of gender differences being greater at higher levels of earnings, the size of the gap in full-time earnings between men and women varies by occupation type.

Figure 47 compares trends in full-time weekly earnings between men and women for the different occupation groups in Scotland. Apart from the lower wages generally experienced by women, it is also noticeable that the highest paid occupation group is different for men (managers, directors and senior officials) compared with women (professional occupations). This is true elsewhere in the UK.

Figure 47: Gross median weekly earnings (2016 prices) by occupation classification, full-time jobs, males and females, Scotland, 1997-2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



A different way of examining the data for Scotland in 2016 is shown below in Figure 48, clearly showing the notably higher male full-time weekly earnings in all occupation groups. If the earnings of men and women were equal, the data points (representing the different occupation groups) would lie on the diagonal line: thus, the further away from the line, the greater the difference in earnings.

Figure 48.

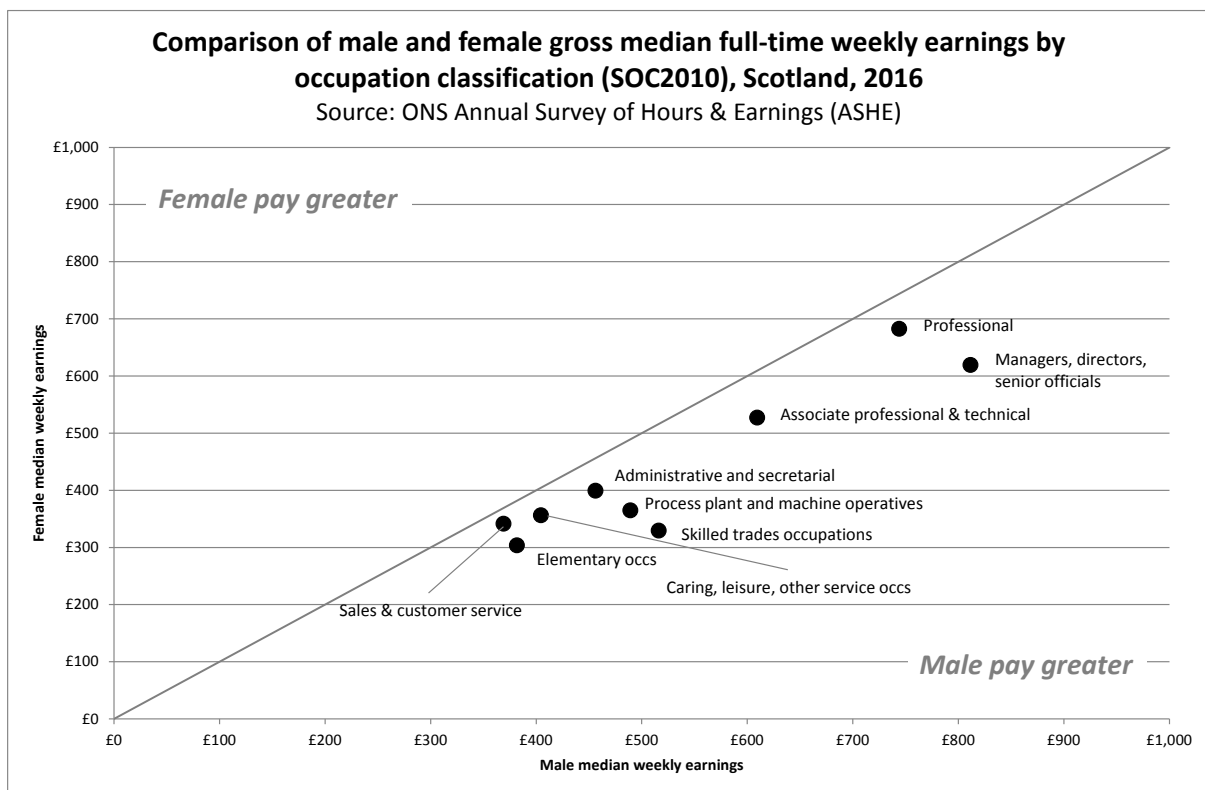


Figure 49 quantifies these differences in 2016 full time earnings between men and women in Scotland for the occupation groupings shown above. This shows that, for example, in 2016 male managers, directors and senior officials in Scotland were paid more than 30% more than their female equivalents. The figures for Glasgow and Edinburgh were higher: 37% and 56% respectively (data not shown). Notable differences between male and female earnings were also observed for skilled trade occupations, elementary occupations and process plant and machine operatives. However, there are notably smaller numbers of women working in some of these categories. For example, in 2016, 17% and 11% of full-time male employee jobs were classified as skilled trade and process plant and machine operatives respectively: the equivalent figures for full-time female jobs were both just 2% (Table 2). Although not shown here, generally similar patterns were seen in the other UK countries and cities analysed. As stated earlier in the report, interpretation of time trends is problematic because of changes in the occupational classifications used; however, reductions in the gap between male and female earnings were observed in most places and for most occupation groups.

Figure 49.

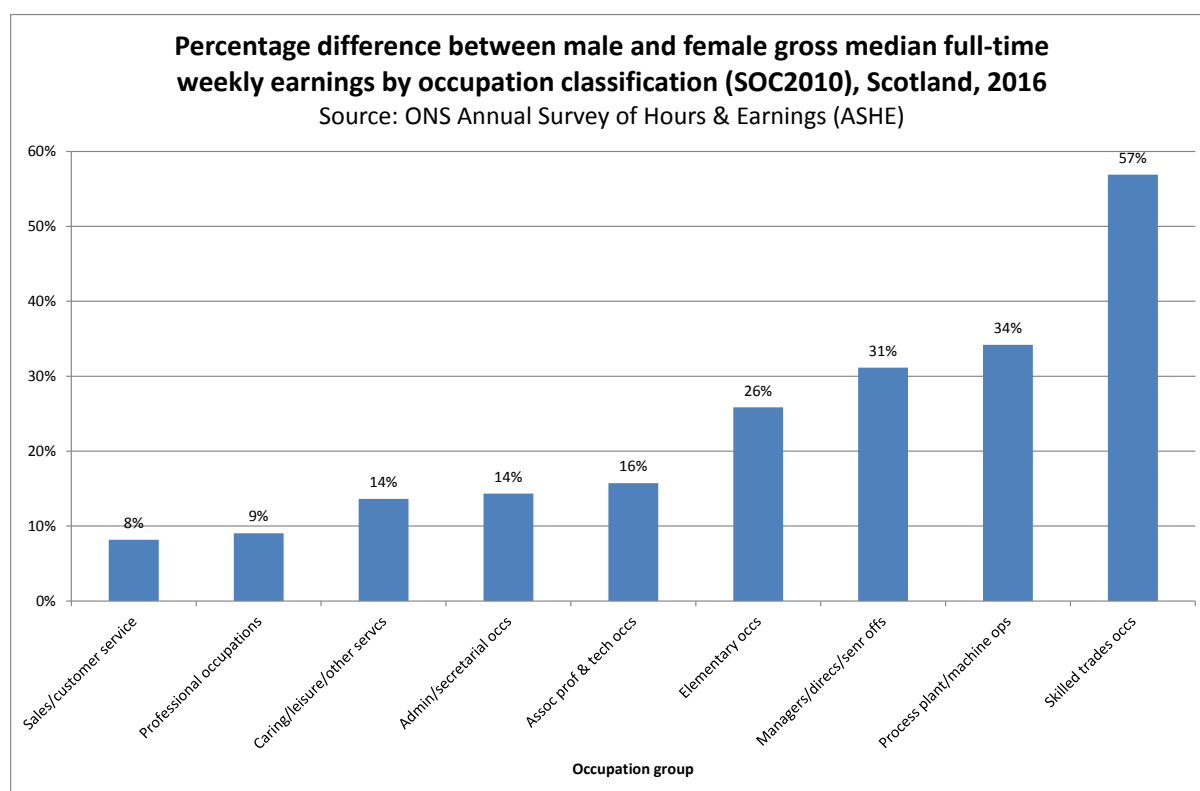


Table 2. Estimated number of full-time jobs by SOC2010 occupation category, Scotland 2016.
Source: ONS Annual Survey of Hours & Earnings (ASHE).

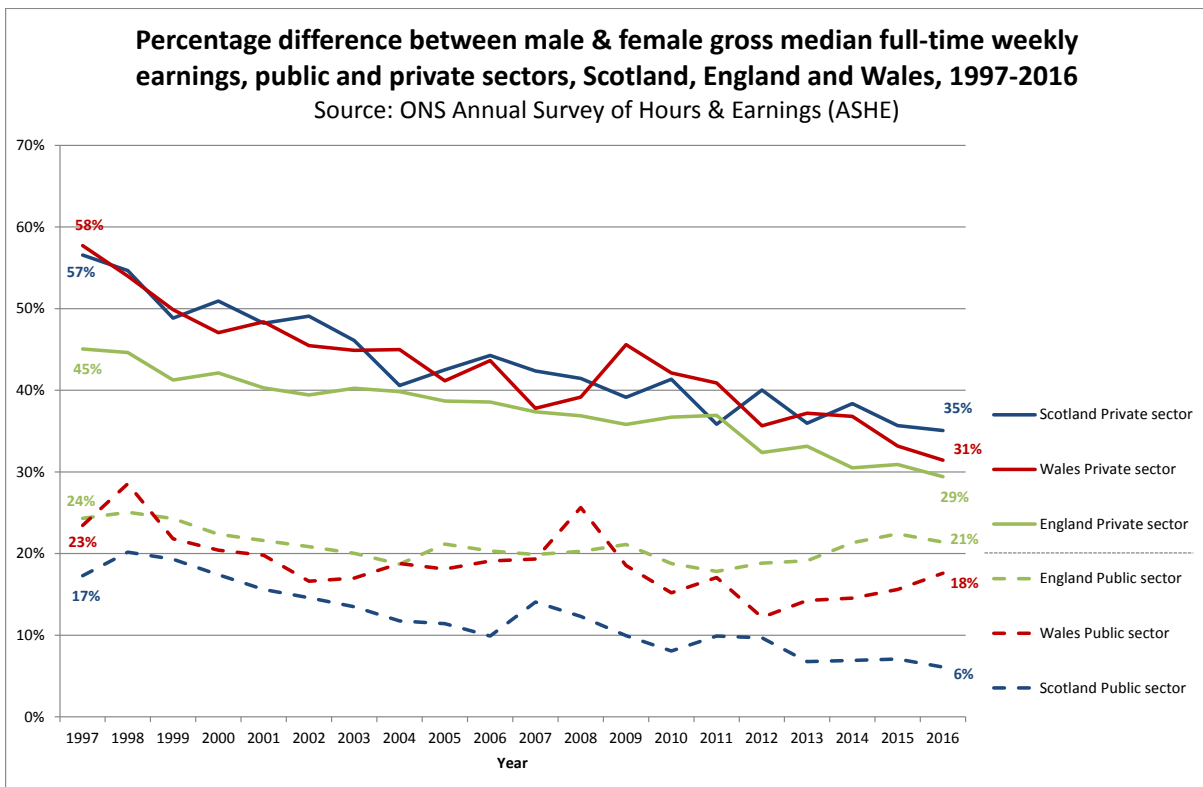
Occupation category	Males		Females	
	Number of full-time jobs	%	Number of full-time jobs	%
Managers directors and senior officials	120,000	13%	63,000	10%
Professional occupations	196,000	21%	196,000	30%
Associate professional and technical occupations	155,000	17%	108,000	16%
Administrative and secretarial occupations	49,000	5%	109,000	17%
Skilled trades occupations	154,000	17%	10,000	2%
Caring leisure and other service occupations	29,000	3%	80,000	12%
Sales and customer service occupations	41,000	4%	47,000	7%
Process plant and machine operatives	100,000	11%	11,000	2%

Elementary occupations	80,000	9%	35,000	5%
Total	924,000	100%	659,000	100%

6.4 Public and private sectors

The gap in median full-time weekly earnings between men and women reduced between 1997 and 2016 in both the public and the private sector. However, the gap has been consistently higher in the private sector. As Figure 50 shows, for example, in the Scottish public sector the gap decreased from 17% to 6% over the period; however, the equivalent figures in the Scottish private sector were 57% and 35%. The trends for both England and Wales are slightly different, with less reduction in the gap in the public sector over time: thus in 2016 the gender gap in the public sector was considerably lower in Scotland (6%) compared with both England (21%) and Wales (18%). Trend data for Northern Ireland were not available, but by 2016 the gap in weekly earnings in the public sector was 11%, and 29% in the private sector (data not shown).

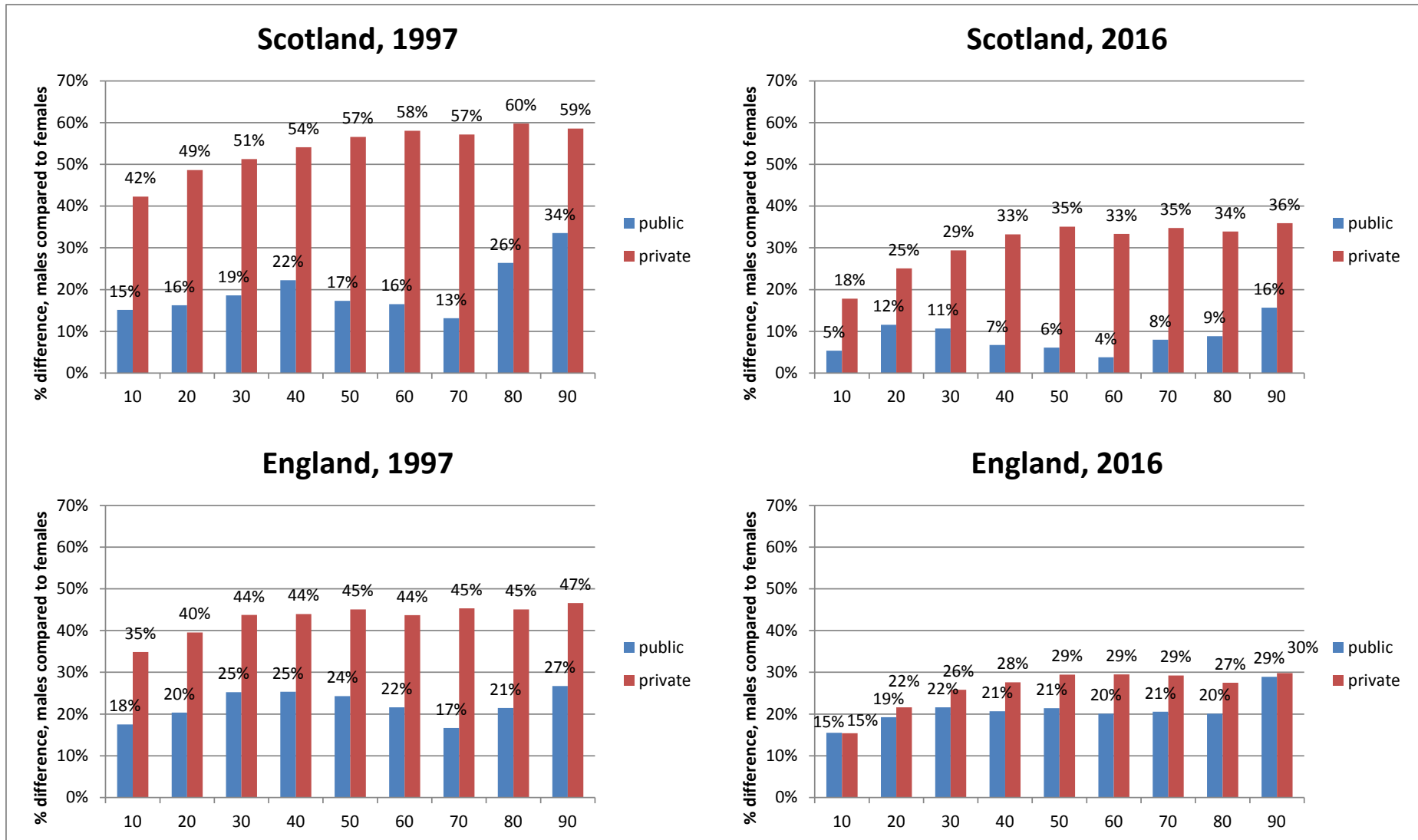
Figure 50.



Looking across the full distribution of earnings, rather than just median values, there is a greater difference between male and female earnings in the private sector compared to the public sector at all levels of pay. This is shown for Scotland in Figure 51. This Figure also shows that (a) the gap between male and female earnings tends to be lower among the less well paid (particularly in the private sector), and (b) in both sectors the gap between men and women decreased at all levels of pay between 1997 and 2016. Equivalent data for England are also shown in Figure 51. The gender gap in the private sector was lower in England than Scotland in both periods, and there has also been less reduction in the gap in the public sector over time, meaning that the gender gap in both sectors is now more alike. The pattern for Wales is more similar to that of Scotland (data not shown)^{xviii}.

^{xviii} Note data for Northern Ireland could not be analysed at this level.

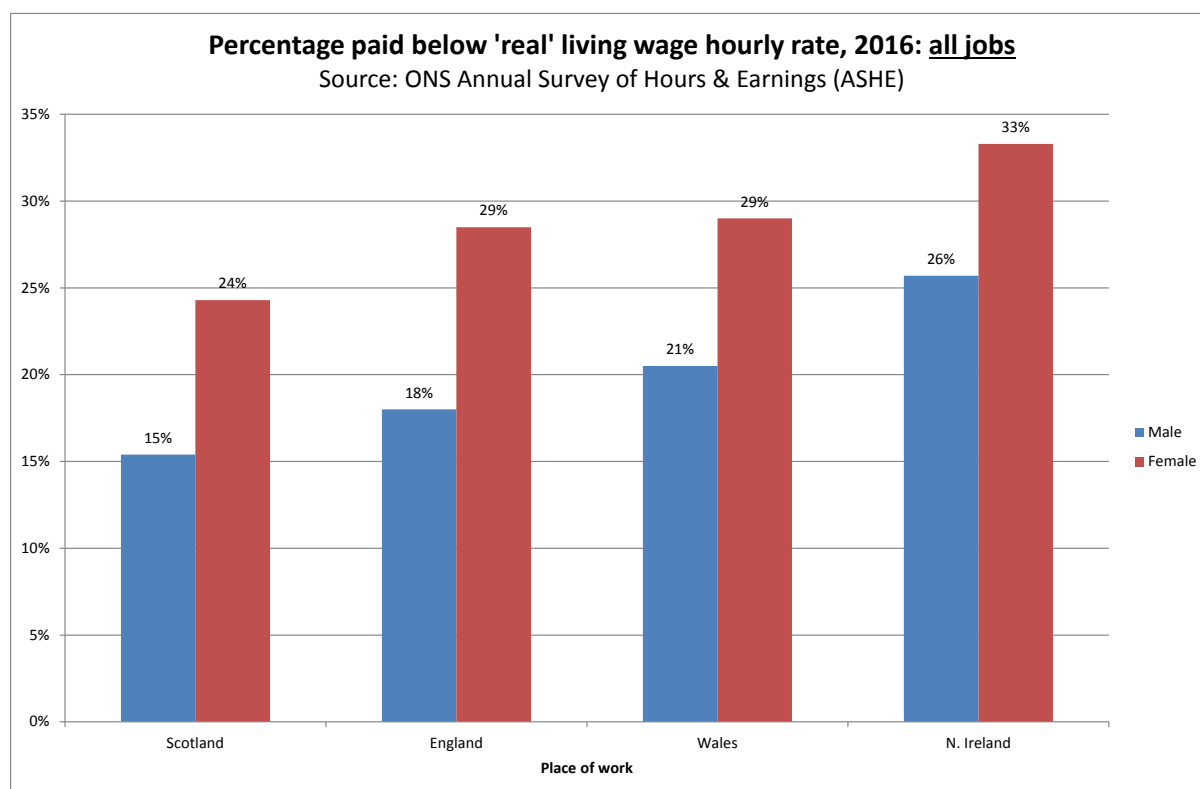
Figure 51: Percentage difference between male and female gross full-time weekly earnings by percentile, public and private sectors, Scotland and England, 1997 and 2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



6.5 Low pay

As stated earlier in the report, in 2016 women were considerably more likely than men to be in a job which paid below the level of the 'real' living wage (RLW). This is confirmed in Figure 52, showing the percentage of *all* jobs paid below that level in the four UK nations, broken down by gender. In Scotland's case for example, Figure 34 previously showed that overall 20% of jobs in Scotland in 2016 were low-paid jobs (by this definition); here, Figure 52 shows that the equivalent figure for women is higher (24%). It is notable that the equivalent figures are higher in England, Wales and, especially, Northern Ireland (where approximately one-third of all low-paid jobs are held by women).

Figure 52.



Part of the explanation for this is that, as shown previously, part-time jobs are much more likely to be paid at a level below the RLW, and – as also shown earlier – the vast majority of part-time jobs in the UK are held by women. However, as Figures 53 and 54 show, even when we restrict the analysis to *full-time* employment, women are still more likely than men to be in this type of low-paid employment: this is true across all four countries, and in the majority of UK cities analysed (with particularly high figures for women evident in the English cities of Liverpool, Sheffield and Birmingham).

Figure 53.

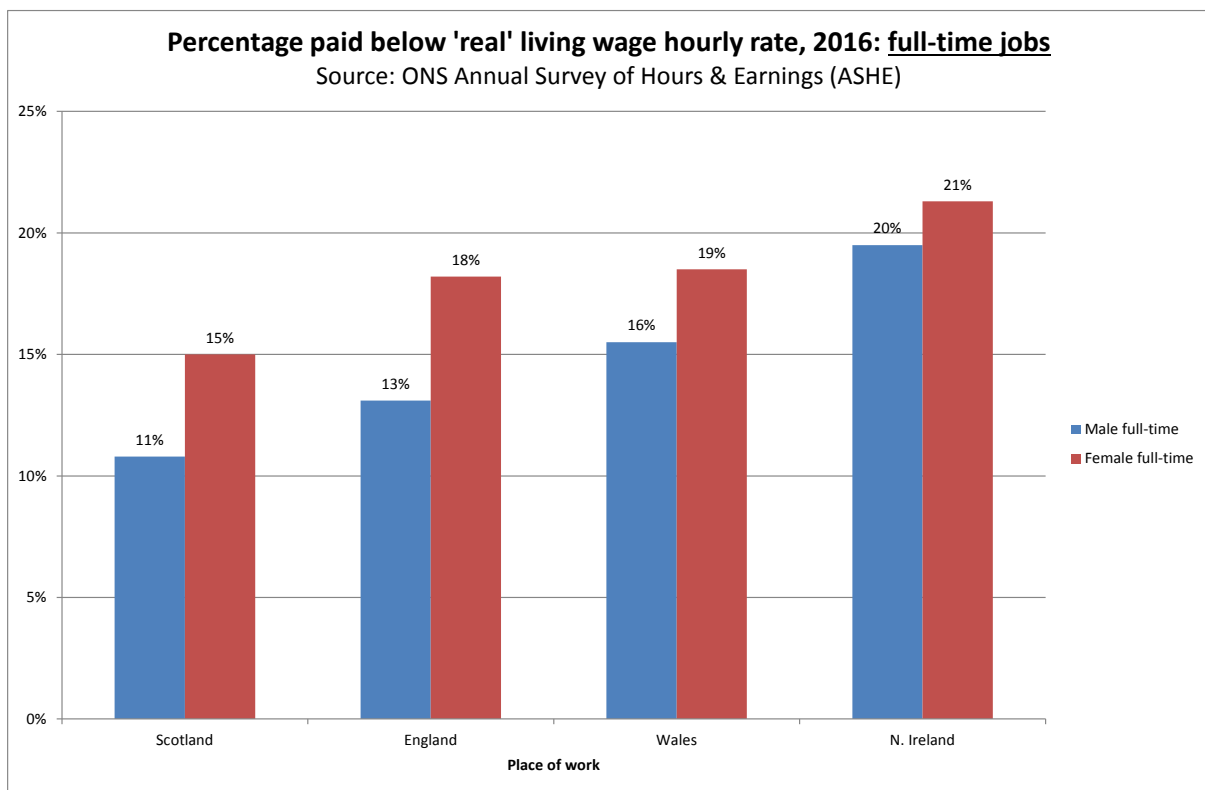
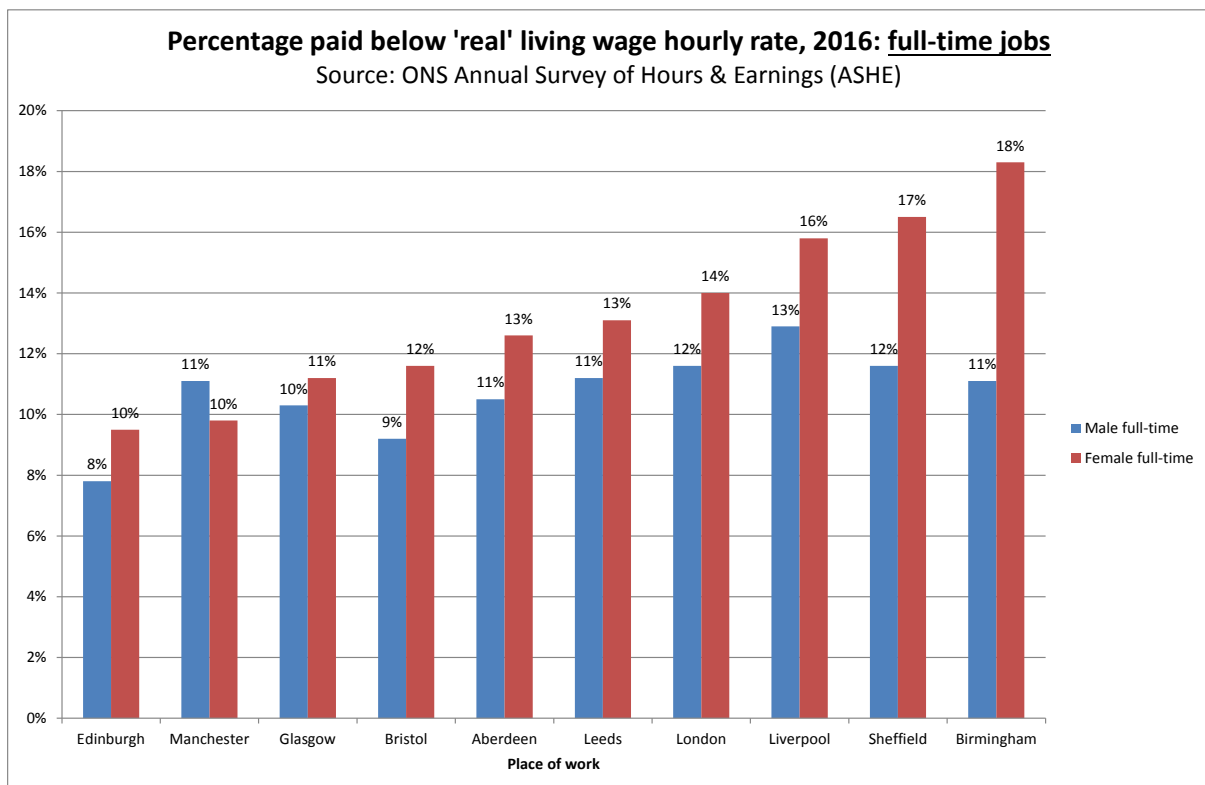


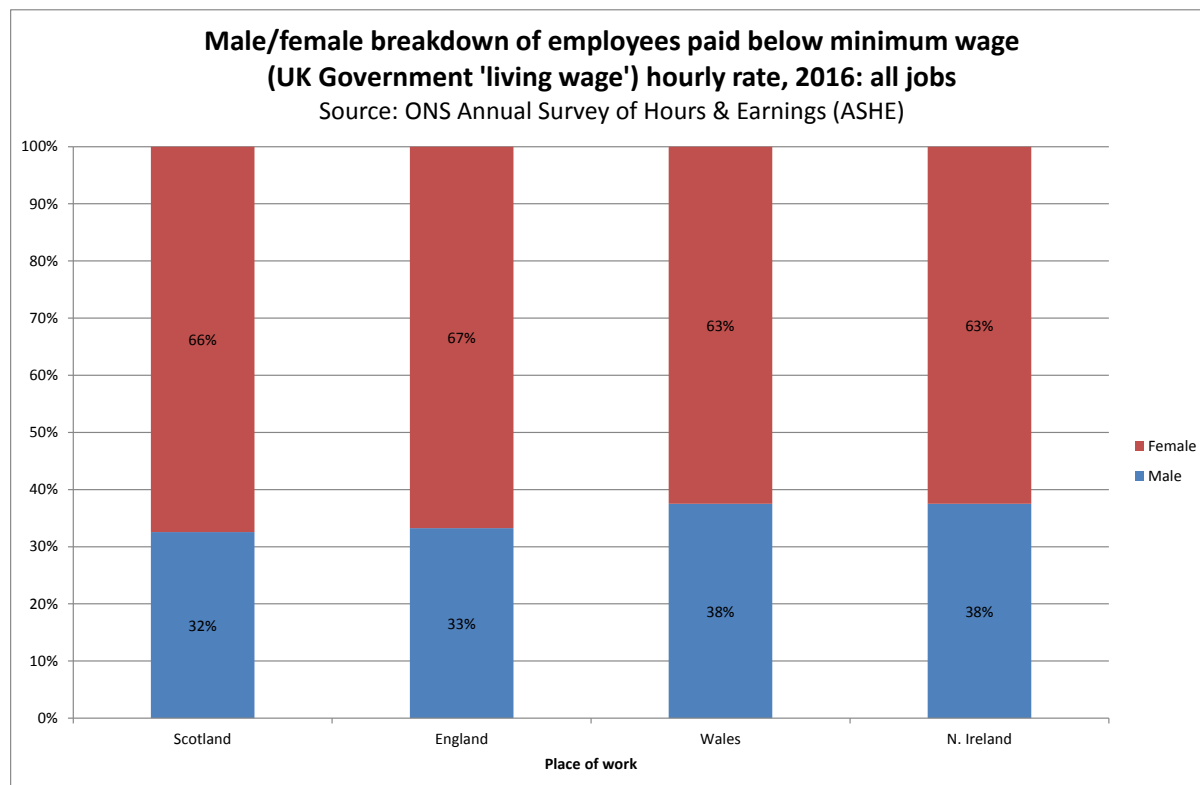
Figure 54.



In terms of the UK government's defined 'living wage' (as stated, this is in effect the minimum wage), Figure 38 above showed that in Scotland in 2016 a total of approximately 44,000 jobs were

paid below this minimum wage level. In terms of the gender divide, Figure 55 below confirms that around two thirds (66%) of these very low paid jobs were held by women. The figures are similar in the other three UK countries.

Figure 55.



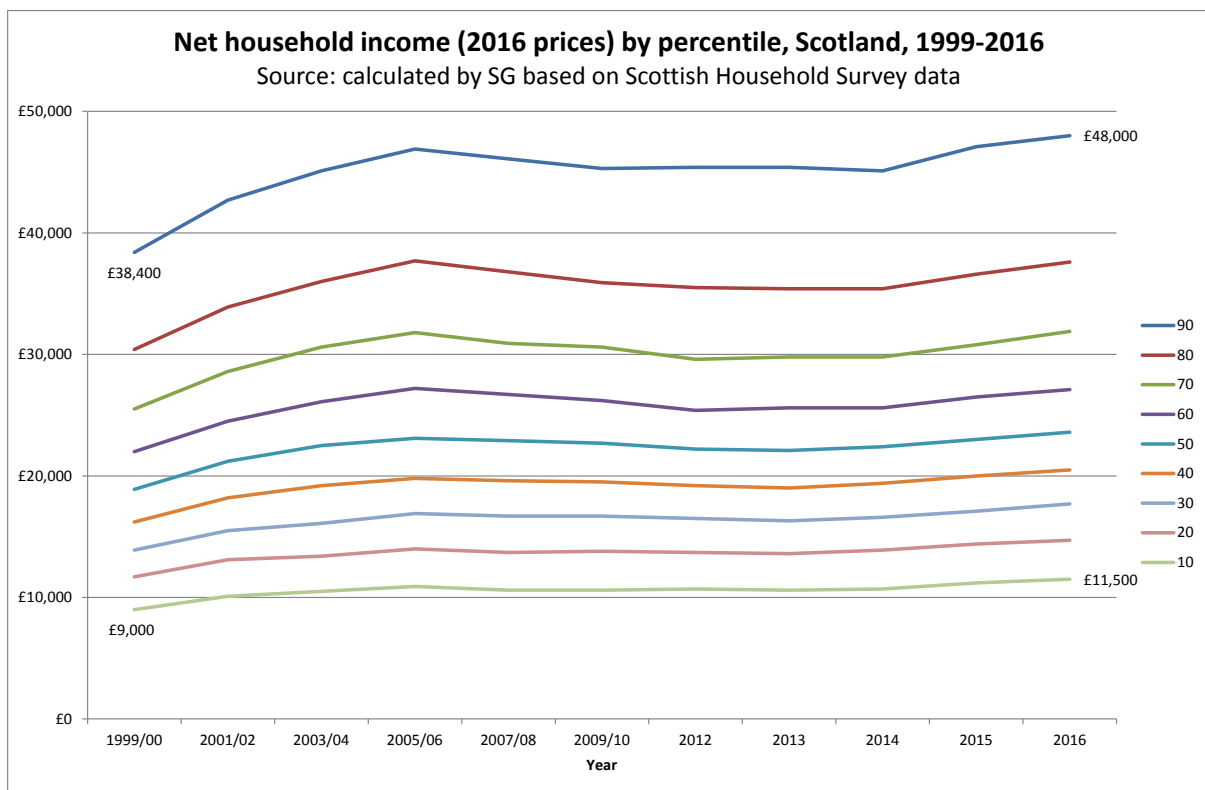
7. Trends in Scottish household income inequality

As stated in the Introduction and Methods sections of the report, additional analyses of trends in total household income inequalities within Scotland were also undertaken. This was important, given the caveats associated with earnings data that were discussed earlier.

Figure 56 shows, for the period 1999/2000 to 2016^{xix}, trends in net household income, by percentile, in Scotland. This presents, broadly, a similar picture to that shown for earnings inequalities (e.g. Figure 6) in terms of: wide inequalities in income generally, with a particular gap evident between the 90th percentile and the rest; increases in income and widening inequality over time, followed by a fall in income levels across most groups around the time of the recession; and a later increase in income in the last part of the time period shown. As with the earnings analyses, all data have been adjusted for inflation and are therefore shown in 2016 prices.

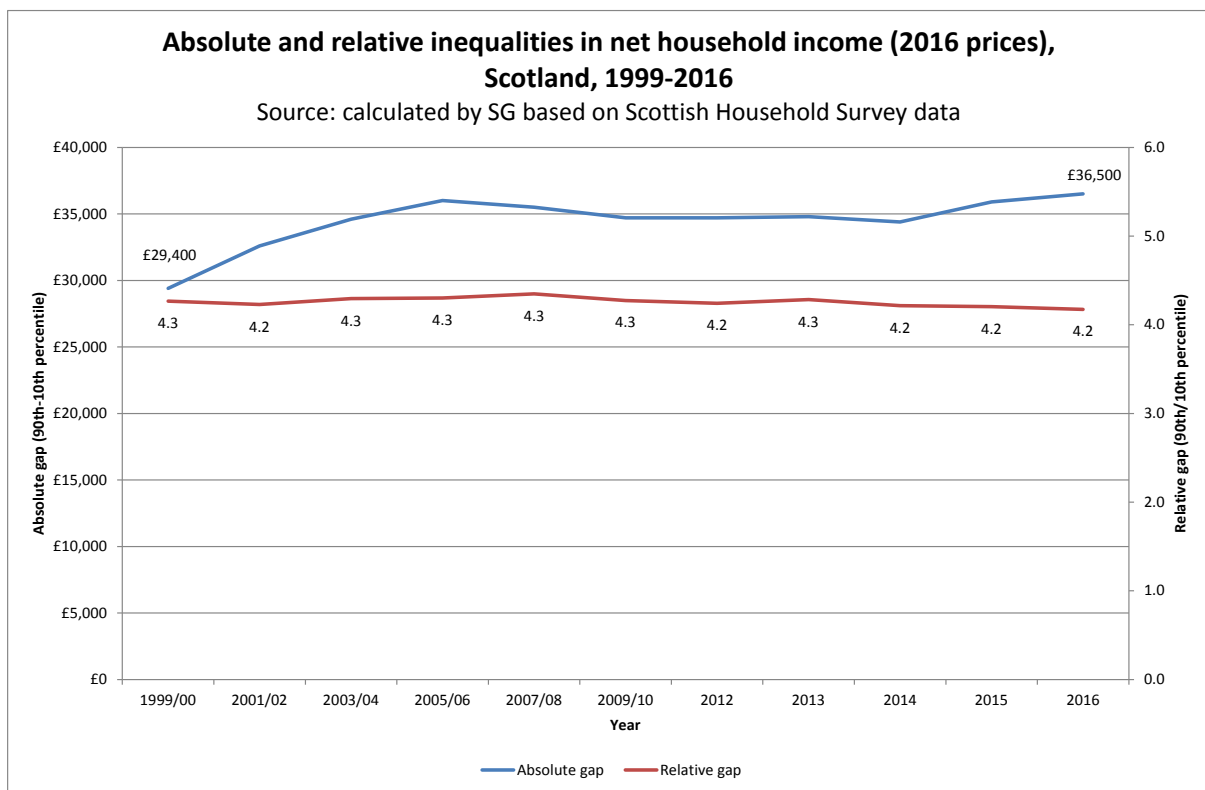
^{xix} Some of the time points in Figure 56 cover two years because, as stated in the Methods, the data collection for the Scottish Household Survey (from which these income estimates have been obtained) spanned those two-year periods. The survey was redesigned in 2012, from when single years of data were used.

Figure 56.



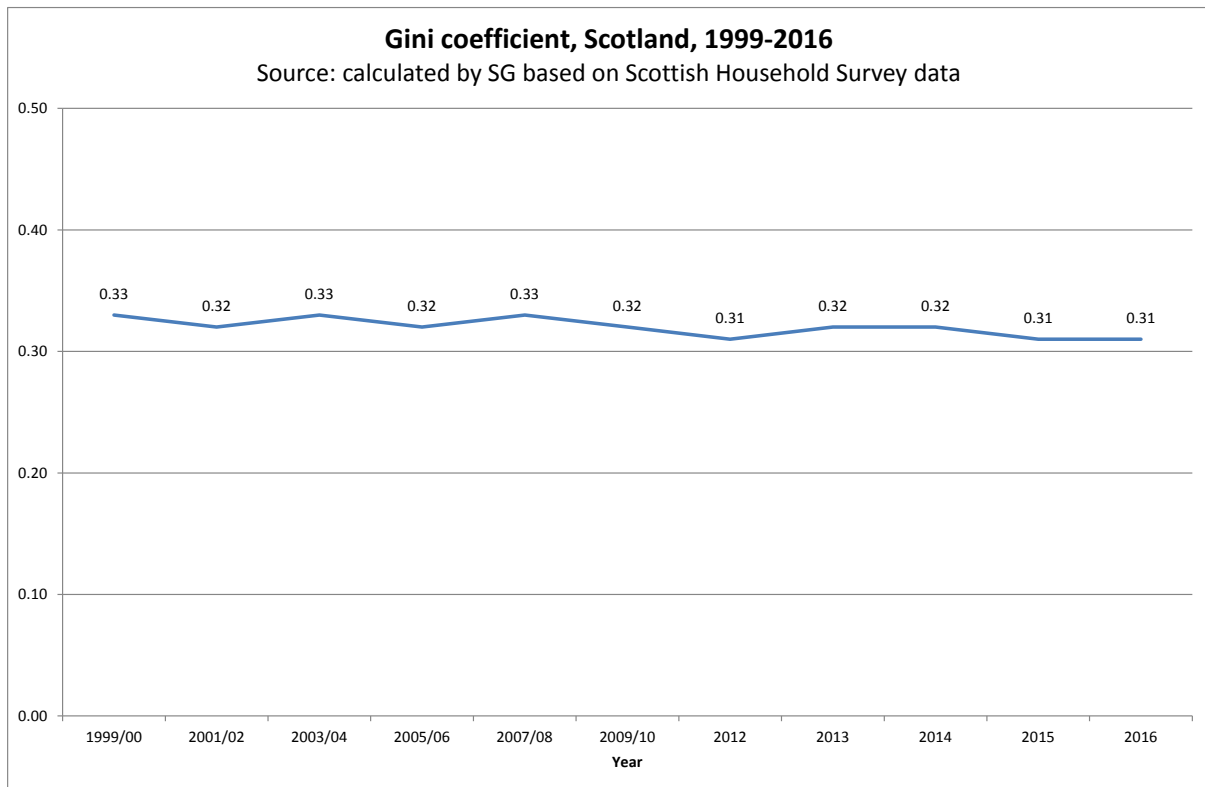
The trends in absolute and relative income inequalities (as defined by the difference between, and ratio of, 90th and 10th percentiles respectively) are also broadly similar to those shown for full-time earnings (Figure 12). Despite some fluctuation, absolute inequalities in household income increased over time, from a difference of £29,400 between the 10th and 90th percentiles in 1999/00, to £36,500 in 2016. Trends in relative inequalities were flat fairly flat, the income of the 90th percentile being consistently around four times those of the 10th percentile (varying between 4.2 and 4.3 times). Both sets of trends are shown in Figure 57.

Figure 57.



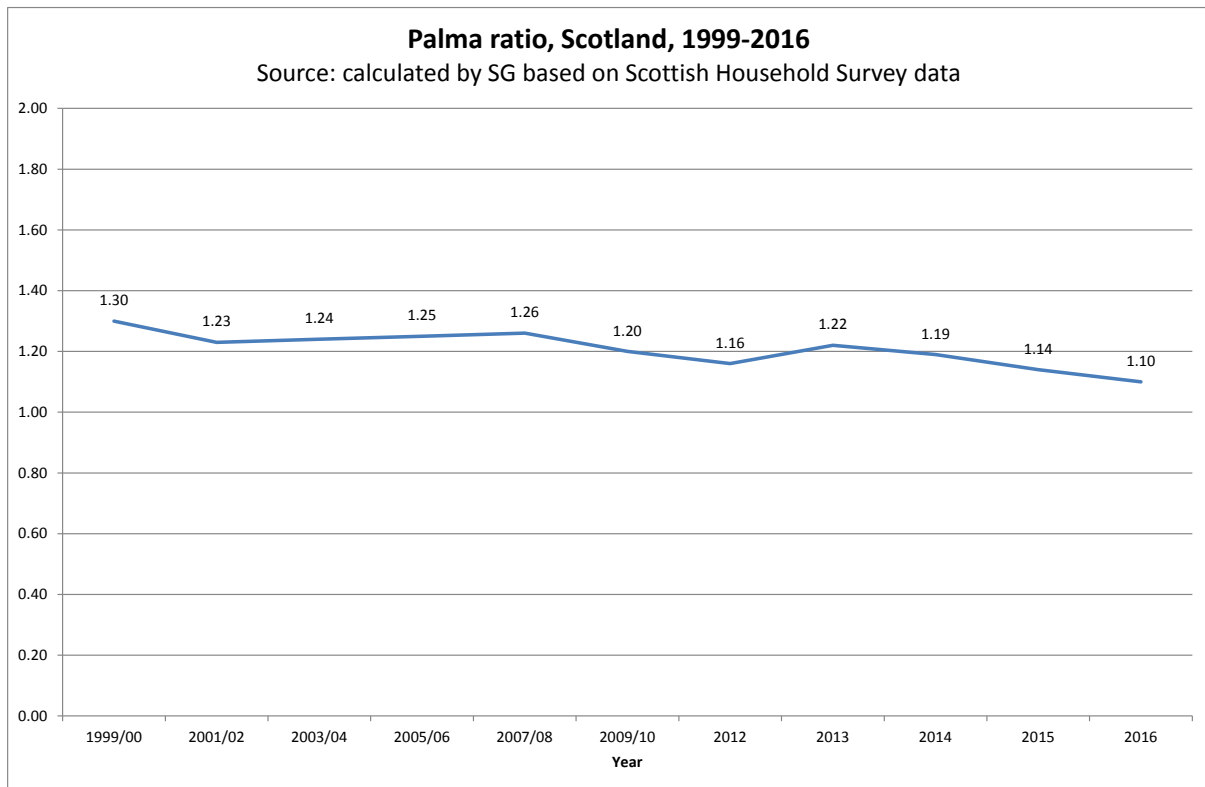
Different, more sophisticated, measures of income inequality also suggest there has been little change in levels of inequality over the time period shown. As stated in the Methods section, the Gini coefficient measures the dispersion of the whole income distribution (i.e. rather than just comparing the extremes) and has a theoretical value ranging from 0 (representing complete equality) to 1 (representing complete inequality). For the data shown here, the Gini in Scotland has fluctuated over time between the values of 0.33 and 0.31. This is shown in Figure 58.

Figure 58.



Another statistical measure of inequality is the Palma ratio, which – as also described in the Methods section – is calculated as the ratio of the richest 10% of the population’s share of income divided by the share of the poorest 40%. As Figure 59 shows, despite year by year fluctuation, the overall trend in the value of this measure is also fairly flat, albeit that the value of the ratio did decrease in the last three years shown (from 1.22 in 2013 to 1.10 in 2016).

Figure 59.



At the level of Scottish local authority areas, relatively small sample sizes in the survey mean we must be very cautious in interpreting trends in income inequality over time. However, two examples are shown here for illustration: the absolute difference between 10th and 90th percentiles, and the relative difference. In both cases data for 1999/00 are compared with data for 2016.

In terms of absolute differences, Figure 60 suggests that the absolute gap in household income widened in every local authority area with the exception of Perth and Kinross. As already shown above in Figure 56, in Scotland as a whole the gap was estimated to be £36,500 in 2016; Figure 60 suggests the gap was highest in Aberdeenshire and Aberdeen (£45,100 and £44,600 respectively), and lowest in West Dunbartonshire (£28,200).

Figure 60.



As Figure 57 showed, the *relative* gap in Scotland changed little between 1999/00 (4.3) and 2016 (4.2). Figure 61 suggests that the pattern across local authorities may be mixed. In 11 local authorities this relative ratio of income inequality increased, while in the remaining 22 local authorities it reduced. As stated in the Methods section, however, because of small sample sizes some of the year-on-year changes and differences between local authorities will be due to sampling (or other) error rather than real differences in incomes in the population.

Figure 61 also suggests that in 2016 East Renfrewshire had the highest income gap between the 10th and 90th percentile (5.1), while Angus had the lowest gap (3.3).

Figure 61.



These recent trends, and fluctuations, in levels of income inequality over the last 15 years or so must be viewed in the context of the dramatic changes in that have taken place in the UK (including Scotland) over the last four decades. Figure 62 shows long-term trends in income inequality (measured by the Gini coefficient) for Great Britain^{xx}. This emphasises both the extent to which UK (including Scottish) society has changed since the late 1970s, and how little recent trends change that overall picture. As the final Figure in the section shows (Figure 63), as a result of these long-term trends, levels of income inequality in the UK are now among the highest in Europe²⁹.

^{xx} Trends in the Gini coefficient for Scotland are not available before 1998/99. However, although income inequality tends to be slightly lower in Scotland compared with Great Britain as a whole, the same overall trend of increasing inequality shown in Figure 62 will also apply to Scotland. Note also that the Gini coefficient figures shown earlier in the report (Figure 58) are not directly comparable to those shown in Figure 62: as detailed in the Methods section, there are differences in ways in which income data are collected in the Scottish Household Survey (the source for the Scottish analyses) and the surveys from which the GB trend is derived.

Figure 62.

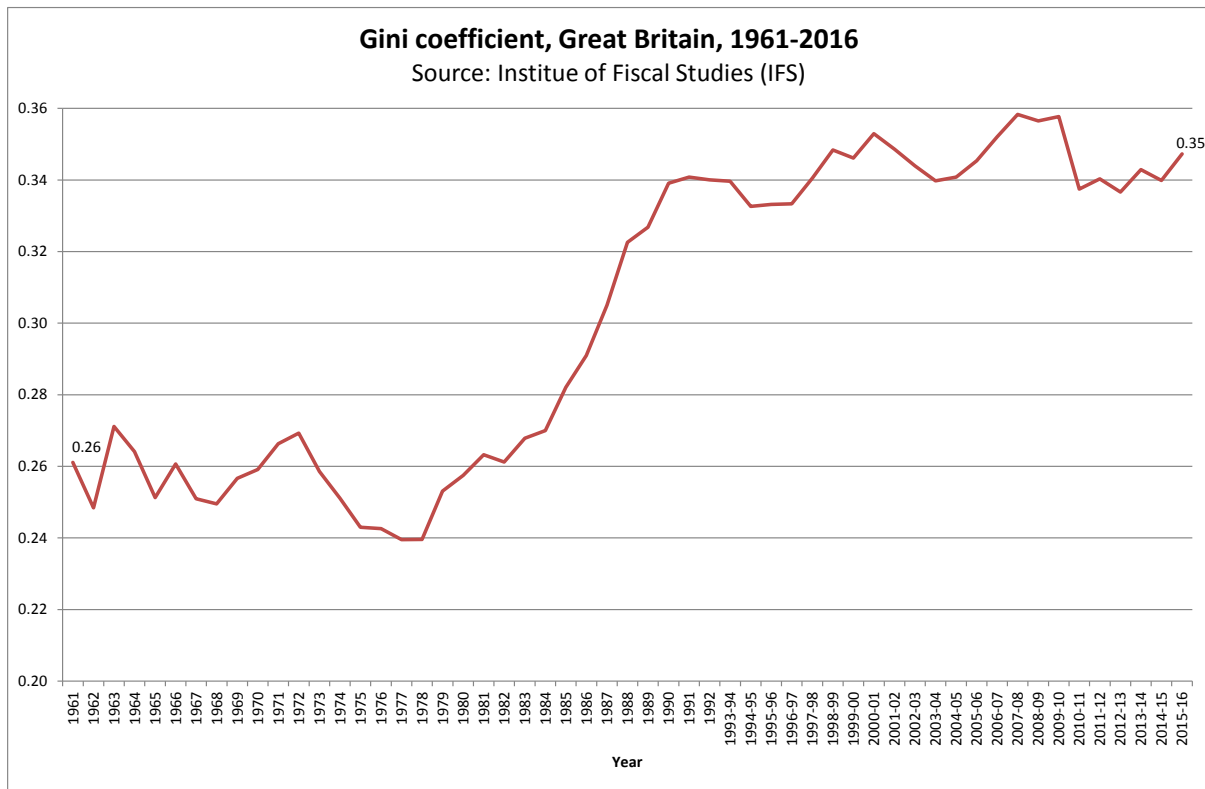
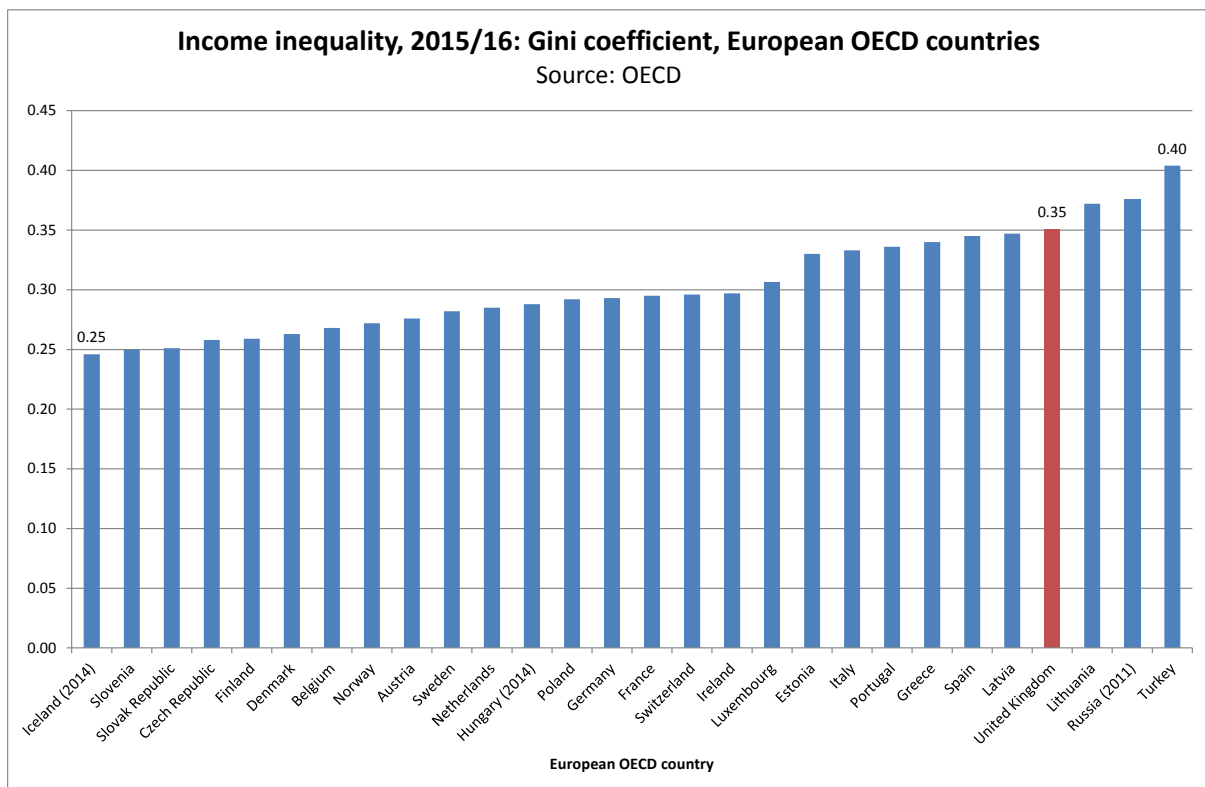


Figure 63.



Discussion

Summary of results

The analyses presented in this report have highlighted a number of important issues regarding recent trends in earnings inequalities and broader income inequalities in Scotland and the UK:

- Absolute inequalities in earnings have widened considerably in Scotland, and in all other parts of the UK, over the past 20 years.
- Relative inequalities widened until around 2011, but then decreased to levels similar to those observed in 1997. However, there are differences between the scale of, and trends in, relative inequalities in earnings from *full-time* (lower and fairly static) and *part-time* employment (higher and increasing).
- Within Scotland, earnings inequalities are widest in Edinburgh and, in particular, Aberdeen.
- The widening of inequalities until the early 2010s was driven by much greater increases in earnings among the highest paid occupation groups.
- Around one third of all employee jobs (and around 40% of female employee jobs) in Scotland are in the public sector: this emphasises the importance of the public sector to the overall distribution of earnings in Scotland, and its potential role in any attempts to narrow inequalities.
- Indeed, there has been some progress in this regard: in the public sector (but *not* in the private sector), increases in earnings among the lowest paid between 1997 and 2016 exceeded increases among the highest paid; the increases also exceeded those for the lowest paid in the private sector. As a result, the lowest paid jobs in the public sector are now generally better remunerated than the lowest paid in the private sector. It is also notable that for full-time employment, increases among the lower paid in the public sector were greater in Scotland than in England.
- Median earnings in the public sector are also higher than in the private sector, particularly for part-time employment. There has also been a widening gap, with private sector workers much more affected by the decrease in earnings following the recession.
- For all employee jobs, relative inequalities in earnings in the public sector have fallen over time, while in the private sector they have increased. This has been particularly driven by differing trends between the sectors in part-time employment.
- In 2016, half a million jobs in Scotland – 20% of all jobs, and almost 40% of part-time jobs – were paid below the level of the ‘real’ living wage (RLW). Approximately 65,000 of those jobs were in Glasgow. The figures had improved slightly by 2017 (especially in parts of Scotland) but remained high.
- The size of the gender gap in earnings varies considerably depending on the choice of statistical measure employed. In 2016, *full-time weekly* earnings in Scotland for men were

almost 20% higher than for women. However, the gap has reduced considerably since 1997, with decreases seen across all occupation groupings.

- The gender gap is greatest among those earning the most.
- In Scotland, reductions in the gap in earnings between men and women have been observed in both the public and private sectors. However, a much larger gap remains in the private sector.
- The reduction in the earnings gender gap in the public sector has been greater in Scotland than in England.
- The lowest paid jobs are predominantly held by women. Approximately two thirds of jobs paid below the RLW, and two thirds of jobs paid below minimum wage levels, are held by women.
- Although a number of caveats are associated with the earnings data presented in the report, the overall trends in full-time earnings inequalities are very similar to trends in more comprehensive household income inequalities.

Strengths & weaknesses

There are a number of weaknesses associated with the data source employed for the analyses of earnings inequalities. First and foremost, it represents only one component (albeit an important one) of overall levels of income. It excludes large numbers of people who are not in full-time or part-time waged employment, for example the elderly, the unemployed, and those too sick to work. It also excludes self-employed earnings and earnings paid as shares and employee benefits. Furthermore the analyses have focused on the 10th and 90th percentiles of the earnings distribution, and thus have excluded the earnings of the very richest and very poorest. Thus, analyses of inequalities within the ASHE dataset will considerably underestimate true levels of income inequality in society. Related to this, as an individual measure, it tells us nothing about *household* income: we cannot take into account the number of people in the household (and how many of them may be dependent on the earnings), and whether or not the earnings are the sole source of income in the household. The fact that earnings are gross and, therefore, do not take account of taxation is another limitation in the sense of understanding true levels of income at the household level. Clearly earnings from the so-called “shadow economy” (or black market) are also excluded, and further weaknesses associated with the data include the fact that the statistical control processes used by ONS meant that not all data were made available for all topics and all geographical areas of interest, and the fact that area definitions were based on place of work, rather than place of residence. In addition, the definition of part-time employment (less than 30 hours per week) is clearly very limited, and changes in levels of part-time earnings over time may reflect both changes in the numbers of hours worked as well as any changes in rate of pay.

However, there are also a number of advantages to using the ASHE data. As a 1% sample of UK HMRC records, it enables detailed analysis of levels of earnings in the UK that would not be possible with other resources; furthermore it does not suffer from the limitations associated with data derived from standard population surveys e.g. smaller sample sizes, falling response rates, issues of

representativeness, and potential inaccuracies of self-reported income estimates. Furthermore, as stated, these analyses of earnings data have been presented alongside analyses of broader household income inequalities (from the Scottish Household Survey) – and notable similarities in some of the trends were observed. With regard to comparisons between place of residence and place of work, differences in the scale of earnings inequalities were obviously only really observed at sub-national level; and among most cities, differences generally were very small, especially for full-time employee jobs^{xxi}.

Implications

As a fundamental driver of health inequalities, income inequalities are important to understand and – for a government with a stated aim of narrowing the health gap – to address. The analyses presented here show that there has been no real narrowing of inequalities in earnings, or broader household income, in recent decades; indeed for some aspects, inequalities have continued to widen. Looking forward, there are further reasons for pessimism: the Institute for Fiscal Studies (IFS) predicts increases in income inequality across the UK in the next four years, driven in large part by the UK government’s ongoing programme of welfare reform³⁰. As part of this widening gap, relative poverty rates are set to increase across the UK (Scotland included), with alarming projections in the scale of child poverty: Scottish Government analyses suggest that by 2030, levels of relative poverty among children will have reached an astonishing 38%³¹. Levels of total poverty in the country are already a huge concern: recent analyses have shown that a staggering one million people (19% of the total population) in Scotland are currently living in relative poverty^{32,xxii}, and the same analyses highlighted many groups that are particularly affected. Alongside high levels of poverty among pensioners, those of working age and (as stated) children, lone parents (90% of whom are women), people with disabilities, and certain ethnic minority groups experience even higher levels of poverty.

In the same way that earnings inequalities underestimate the scale of overall *income* inequalities, so income inequalities underestimate the levels of *wealth* inequalities in Scotland. The scale of household wealth inequalities was highlighted in another recent Scottish Government publication which examined trends between 2006 and 2014³³. This showed that the wealthiest 10% of households in Scotland owned 43% of all private net wealth held by the population, while in contrast the least wealthy 50% of households owned just 9% of all such wealth. Furthermore, the wealthiest 1% alone owned more wealth than the bottom 50%. Again, aspects of these inequalities have widened over time: in 2012/14, the wealthiest 10% of households had 9.4 times more wealth than the bottom 40%, an increase from 8.8 times in 2010/12.

In contrast, however, the analyses of gender inequalities in earnings present a rather more encouraging picture of a different aspect of socioeconomic inequality. For full-time earnings, the gender gap between 1997 and 2016 more than halved in Scotland, with particularly striking reductions observed in Edinburgh and Aberdeen. That said, however, the level of gender inequality is still very high – although that level varies considerably depending on which statistical measure is employed. In 2016 the ‘official’ measure of the gender earnings gap – based on comparison of *hourly*

^{xxi} An exception was Manchester where, for all jobs (rather than full-time jobs) relative inequalities based on place of work were smaller than those based on place of residence in most years of analysis (e.g. 5.2 compared with 7.0 in 2016).

^{xxii} This is defined as relative poverty after housing costs in the period 2014-2017.

full-time earnings – was calculated to be 7% (down from 19% in 1997). However, a comparison of hourly earnings gives no indication of differences in numbers of hours worked, and therefore differences in *total earnings*: when the analyses are based on *weekly* full-time earnings, male earnings in 2016 were 18% higher than female earnings. Furthermore, if we compare earnings for all jobs – full time and part time – male weekly earnings in Scotland were 50% higher in 2016; even *hourly* earnings for all jobs were 20% higher among men. As stated, part of the explanation for the latter high figures is that the vast majority of part-time jobs (which are also more likely to be less well-paid) are held by women, itself part of the complex set of factors which have been shown to drive the earnings gap (and which explain some of the changing trends). These factors include employer discrimination, historical educational attainment levels and, most importantly of all, career disruption brought about by having children and subsequently taking on a disproportionate share of family caring responsibilities^{28,34,35}. Analyses by the IFS have shown the gender gap is relatively small among those entering the labour market for the first time, but that it emerges among employees in their mid-20s, and increases enormously after the birth of a first child. The impacts on numbers of hours worked, choices of occupation and employment sector, and can result in less job experience compared with men, which confers additional disadvantage.

The analyses presented here show both a smaller gender earnings gap in the public sector compared with the private sector across the UK, but also a greater narrowing of that gap in Scotland compared with England. The former is well established^{15,36}; reasons for the latter are less clear but may be linked to Scotland's relatively greater proportion of jobs in the public sector together with greater adoption of the RLW and/or greater compliance with UK government minimum wage legislation. Recent well-publicised equal pay court rulings against Scottish local authorities may also be relevant. There have also been Scottish Government gender equality initiatives such as '50/50 by 2020'³⁷ and other actions in areas such as gender equality funding and increased childcare provision³⁸ which may be relevant, although clearly further research would be required to explore this.

A different, contrasting, aspect of gender inequality is the lower earnings among men in part-time jobs. This is particularly relevant when viewed alongside the notable increase in the numbers of men employed in part-time roles. The latter is likely to reflect increases in 'involuntary' part-time employment³⁹ – i.e. relating to people unable to find full-time jobs – and, therefore, to increasing levels of in-work poverty observed in recent years⁴⁰.

The greater increases in full-time earnings among the less well-paid in Scotland's public sector compared with England's may also be attributable in part to the Scottish Government's Scottish Living Wage accreditation initiative⁴¹. Previous pay agreements for the lowest paid NHS staff in Scotland may also be relevant⁴². More generally, the increase in the minimum wage by the UK government in 2016 may be relevant to the narrowing of earnings inequalities in the public sector observed across the UK (and, obviously, to the decreases in numbers of employees earnings less than the RLW between 2016 and 2017). In contrast, the increased earnings inequalities in the private sector is a clear concern: the smaller rates of increase in earnings among the lowest paid (compared with both the higher paid in the private sector and the lower paid in the public sector) must be viewed in the context of lower pension provision that already exists in that sector⁴³, as well as the increasing nature of job insecurity affecting both sectors^{44,45}. Related to that, the data show that the recent recession appears to have had a greater impact on earnings in the private sector than in the public sector – although both sectors have been affected. The IFS has recently commented on the

persistence of the effects of the recent recession in comparison to previous recessions: they highlighted that median earnings are still “remarkably” below pre-recession levels and, more generally, “what an astonishing decade we have just lived through, and continue to live through”, with the UK economy having experienced “record low earnings growth, record low interest rates, record low productivity growth, record public borrowing followed by record cuts in public spending”⁴⁶.

With no overall narrowing of earnings and income inequalities in the last two decades, and forecasts for future widening of such inequalities across the UK, it is clear that action is required by government. In Scotland specifically, this could entail a variety of approaches. For example, with power over public sector pay, the Scottish Government has the ability to directly redistribute paid income among a very sizeable section of Scottish society. Their current approach (as recently implemented as part of the NHS pay agreement, as mentioned above) of freezing senior pay and increasing pay at lower levels could be expanded to *reducing* the pay of the highest earners in order to *increase* that of the least well paid. More broadly, previous recommendations aimed at narrowing income inequalities in Scotland highlighted a range of policy options that were available with existing and recently devolved powers, including changes to income and corporate taxation, reductions in inequalities in the ownership of capital, new measures of wealth and asset taxation, and a variety of actions to address poverty. These could be implemented alongside additional learning from the approaches of other countries with narrower earnings (and income) inequalities^{xxiii}.

^{xxiii} It should be noted that in discussing these potential policy responses, we have obviously not attempted to estimate associated costs, or to assess other potential implications. That would require a much more detailed set of economic analyses which are clearly beyond the scope of this report.

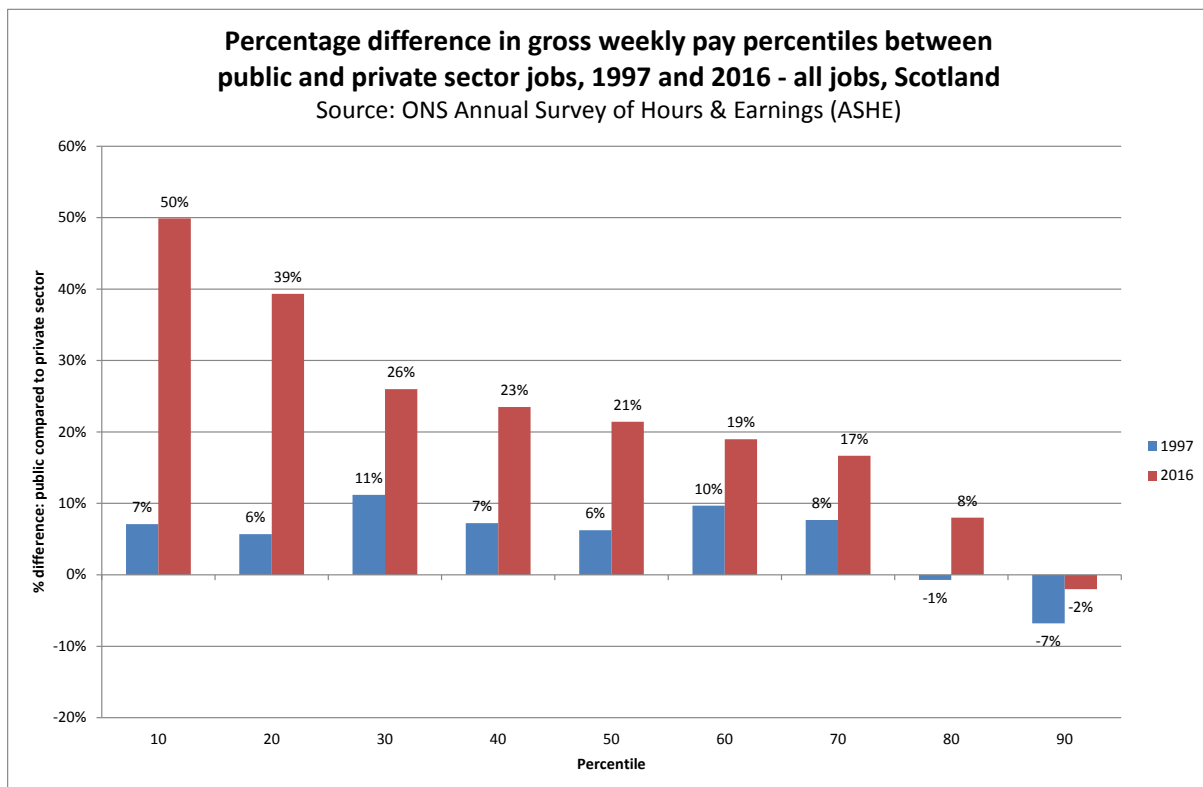
Conclusions

This report has highlighted a number of positive developments, for example a narrowing of earnings inequalities in the public employment sector (albeit principally for part-time employment) and notable reductions in gender inequalities in earnings. However, the bigger picture causes concern. Income inequalities in Scotland have widened considerably since the late 1970s. The more recent trends presented in this report show that, despite these small improvements, there has been no meaningful narrowing of the gap in the last 20 years: this is true of household income inequalities and also earnings inequalities, which have been the focus of most of this report. Independent forecasts suggest income inequalities are set to widen further in the years ahead. As income inequality in society is one of the fundamental causes of health inequality, without political action to address this issue, health inequalities in Scotland will also continue to widen. Given the Scottish Government's documented commitment to addressing poor health and inequality⁴⁷⁻⁴⁹, it is clear that all available economic powers need to be employed to narrow income inequalities in Scottish society.

Appendix A: additional analyses of earnings in public and private employment sectors

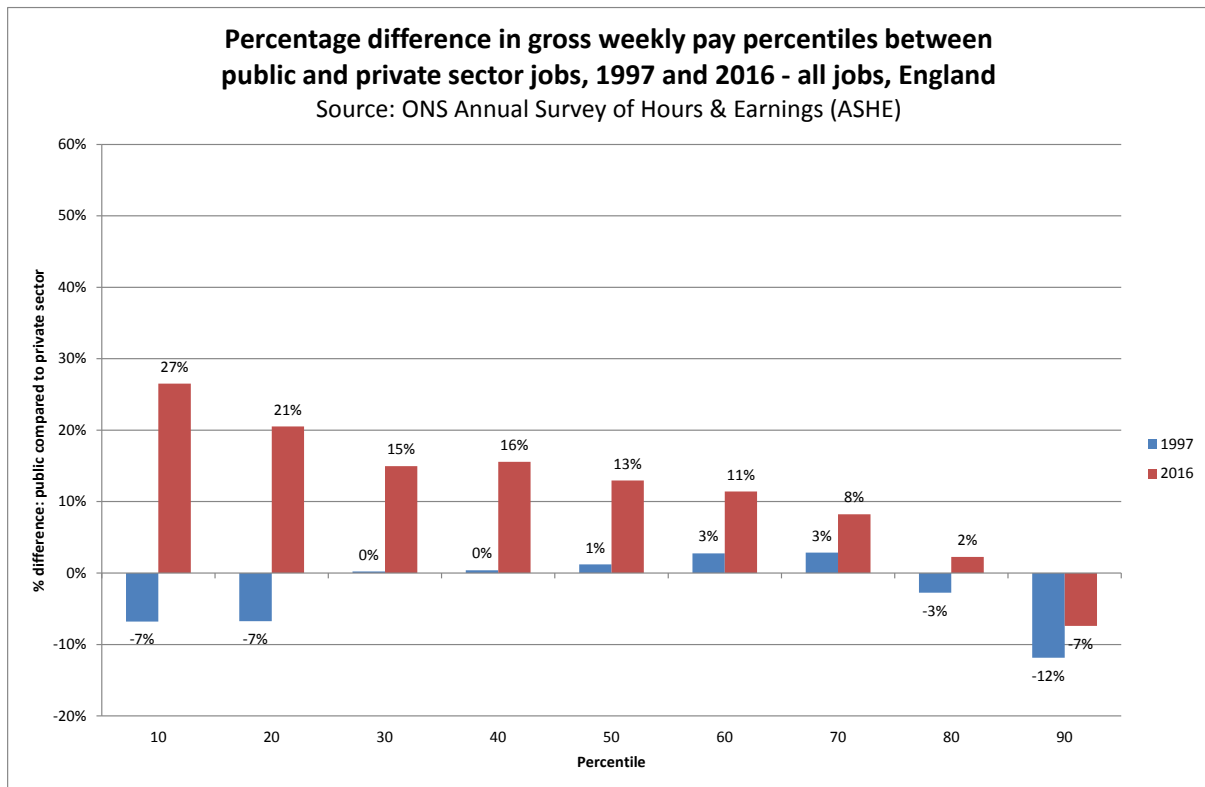
The analyses of the earnings data highlighted notable differences in the distribution of earnings between the public and private sectors. Figure A1 compares the distribution of earnings in the private sector in Scotland with the public sector in 1997 and 2016, showing the percentage difference in earnings between the two sectors for each percentile at the two points of time. A number of issues are apparent. First, in all but the best paid jobs, jobs in the public sector in 2016 were better remunerated than jobs in the private sector. Second, a clear gradient across the earnings distribution is apparent in this regard: the lower the level of earnings, the higher the relative difference between the sectors. Third, this gradient was not evident 20 years previously, when the gap between the public and private sectors in Scotland was much smaller, and more evenly distributed.

Figure A1.



Similar data for England are shown in Figure A2. The same overall pattern is evident, but with two differences: a smaller gap between the public and private sectors across the distribution in both periods; relatively higher pay in the private sector in the comparison of the 90th percentiles.

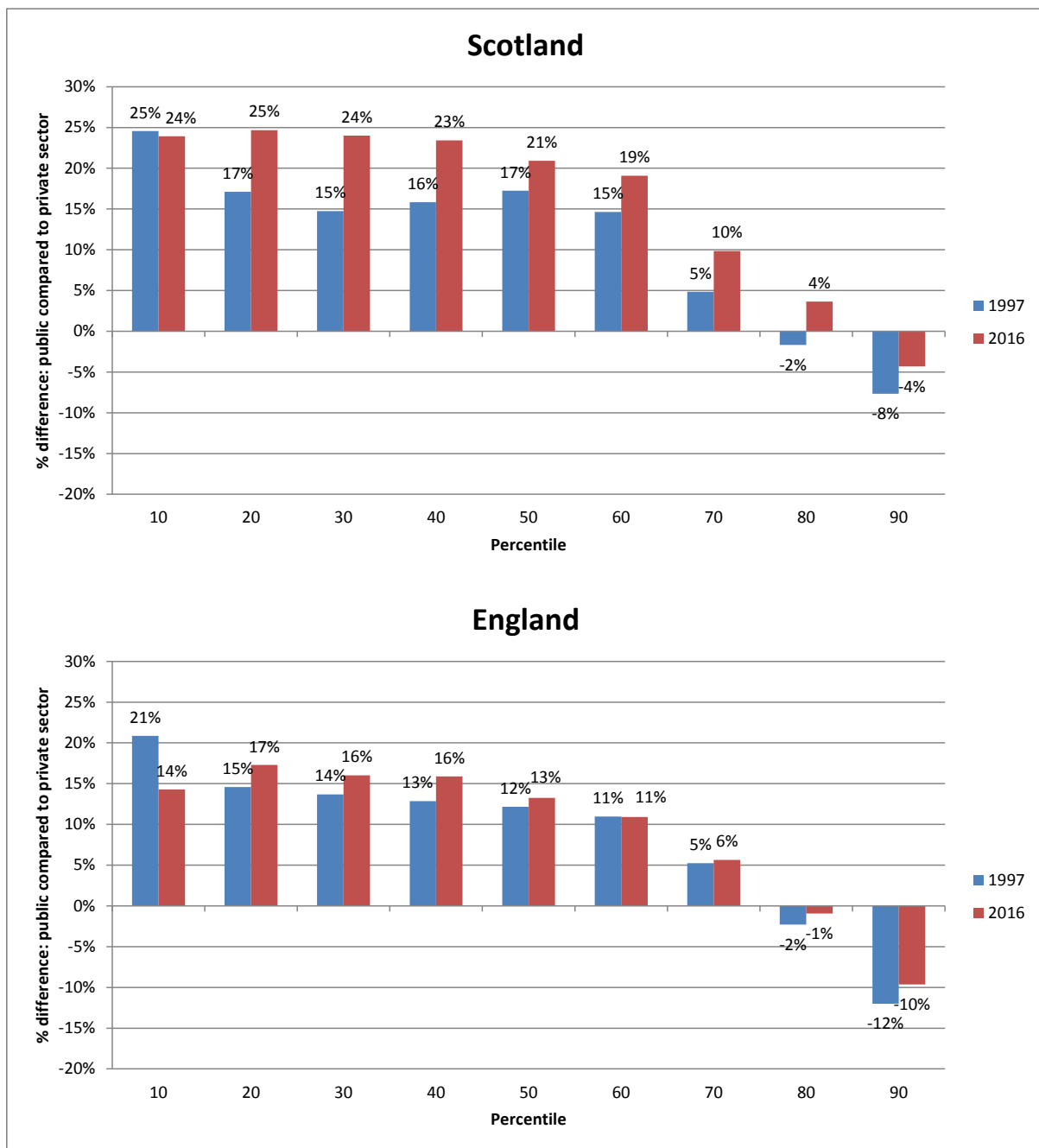
Figure A2.



The figures for Wales (not shown here) are similar. Data by percentile for public and private sectors are not available for Northern Ireland, nor for the majority of cities included in the analyses.

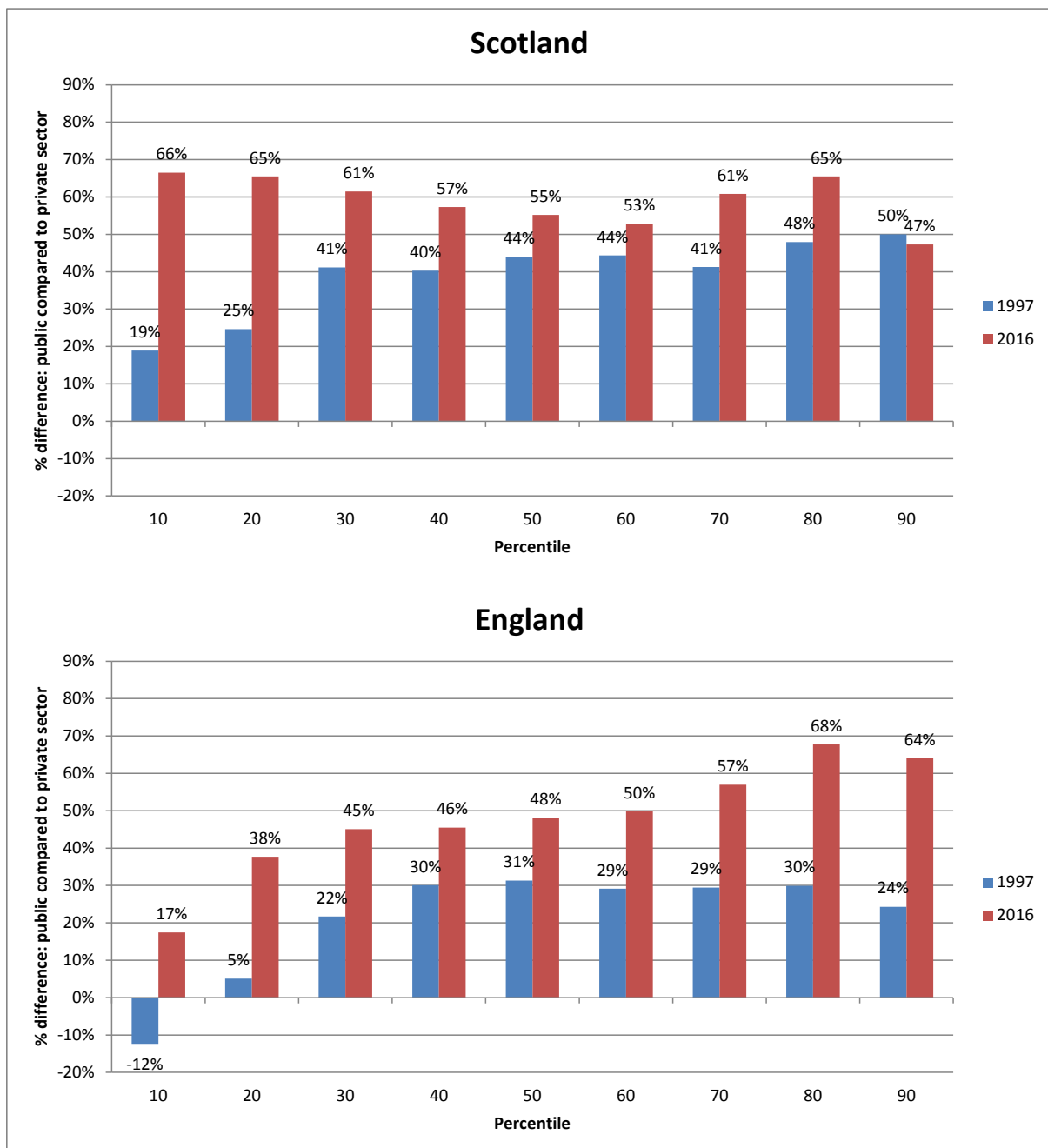
As Figure A3 shows, the pattern for full-time earnings in Scotland is broadly similar, although there are two differences: first, the gap between the public and private sectors across the distribution is smaller; second, a gradient (i.e. the relative difference in earnings between the sectors decreasing with increasing pay) was also evident in 1997. Data for England (also shown in Figure A3) are similar, although again the gap between the public and private sectors is smaller.

Figure A3: Percentage difference in gross weekly pay percentiles between public and private sector jobs, full-time jobs, Scotland and England, 1997 and 2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



For *part-time* jobs in Scotland, there is less evidence of a gradient: part-time earnings in 2016 were notably higher in the public sector across the whole distribution. This is slightly different than in 1997 where a ‘reverse gradient’ (i.e. the gap between public and private sector was greater among the better paid), and it is also different to England – where such a ‘reverse gradient’ is still evident. These data are shown for the two countries in Figure A4.

Figure A4: Percentage difference in gross weekly pay percentiles between public and private sector jobs, part-time jobs, Scotland and England, 1997 and 2016. Source: ONS Annual Survey of Hours & Earnings (ASHE).



There are differences, therefore, in earnings between the public and private sectors. For all jobs (including full-time jobs), earnings are generally higher in the public sector – particularly among the less well-paid. The exception is among the highest paid (90th percentile), particularly in England.

References

- ¹ Walsh D, McCartney G, Collins C, Taulbut M, Batty GD. *History, politics and vulnerability: explaining excess mortality in Scotland and Glasgow*. Glasgow: GC PH; 2016. Available at: https://www.gcph.co.uk/publications/635_history_politics_and_vulnerability_explaining_excess_mortality (accessed October 2018). Policy recommendations also available at: https://www.gcph.co.uk/assets/0000/5587/Excess_mortality_-_Policy_recommendations.pdf (Accessed October 2018)
- ² McCartney G, Walsh D, Whyte B, Collins C. Has Scotland always been the 'sick man' of Europe? An observational study from 1855 to 2006. *European Journal of Public Health* 2012;22(6):756-760.
- ³ Whyte B, Ajetunmobi T. *Still 'The Sick Man of Europe'? Scottish mortality in a European context 1950-2010: an analysis of comparative mortality trends*. Glasgow: GCPH; 2012. Available at: http://www.gcph.co.uk/publications/391_still_the_sick_man_of_europe (accessed September 2018)
- ⁴ Popham F, Boyle P. *Assessing socio-economic inequalities in mortality and other health outcomes at the Scottish national level. Final report for the Scottish Collaboration for Public Health Research and Policy*. St Andrews: University of St Andrews; 2011. Available from: <http://www.scphrp.ac.uk/wp-content/uploads/2014/05/Assessing-socio-economic-inequalities-in-mortality-and-other-health-outcomes.pdf> (accessed September 2018).
- ⁵ Eikemo TA, Mackenbach JP. *EURO GBD SE: the potential for reduction of health inequalities in Europe. Final Report*. Rotterdam: University Medical Center; 2012.
- ⁶ Popham F, Boyle P. *Assessing socio-economic inequalities in mortality and other health outcomes at the Scottish national level. Final report for the Scottish Collaboration for Public Health Research and Policy*. St Andrews: University of St Andrews; 2011. Available from: <http://www.scphrp.ac.uk/wp-content/uploads/2014/05/Assessing-socio-economic-inequalities-in-mortality-and-other-health-outcomes.pdf> (accessed September 2018).
- ⁷ Taulbut M, Walsh D, McCartney G, Parcell S, Hartmann A, Poirier G, Strniskova D, Hanlon P. Spatial inequalities in life expectancy within post-industrial regions of Europe. *BMJ Open* 2014;4(6):e004711.
- ⁸ Link BG, Phelan JC. McKeown and the idea that social conditions are fundamental causes of disease. *American Journal of Public Health* 2002;92(5):730-732.
- ⁹ Scott S, Curnock E, Mitchell R, Robinson M, Taulbut M, Tod E, McCartney G. *What would it take to eradicate health inequalities? Testing the fundamental causes theory of health inequalities in Scotland*. Glasgow: NHS Health Scotland; 2013. Available from: https://www.scotpho.org.uk/media/1178/scotpho131018_whatwouldittake_report.pdf (accessed October 2018)
- ¹⁰ Beeston C, McCartney G, Ford J, Wimbush E, Beck S, MacDonald W, Fraser A. *Health Inequalities Policy review for the Scottish Ministerial Task Force on Health Inequalities*. Glasgow: NHS Health

Scotland; 2013. Available from: <http://www.healthscotland.scot/publications/health-inequalities-policy-review> (accessed October 2018).

¹¹ Dorling D, Rigby J, Wheeler B, Ballas D, Thomas B, Fahmy E, Gordon D, Lupton R. *Poverty, wealth and place in Britain, 1968 to 2005 - Understanding the Transformation of the Prospects of Places*. Bristol: The Policy Press; 2007.

¹² Cribb J, Hood A, Joyce R, Norris Keiller A. *Living Standards, Poverty and Inequality in the UK: 2017*. London: Institute of Fiscal Studies (IFS); 2017. Available from: <https://www.ifs.org.uk/uploads/publications/comms/R129%20-%20HBAI%20report%202017.pdf> (Accessed September 2018)

¹³ Office for National Statistics (ONS). *Annual Survey of Hours and Earnings, Low pay and Annual Survey of Hours and Earnings pension results Quality & Methodology Information report*. Newport: ONS; 2018. Available from: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/methodologies/annualsurveyofhoursandearningslowpayandannualsurveyofhoursandearningspensionresultsqmi> (Accessed October 2018)

¹⁴ Smith R. *Guide to interpreting Annual Survey of Hours and Earnings (ASHE) estimates*. Newport: ONS; 2017. Available from: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/methodologies/guidetointerpretingannualsurveyofhoursandearningsasheestimates> (Accessed October 2018)

¹⁵ Office for National Statistics (ONS). *Employee earnings in the UK Statistical bulletins*. <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/annualsurveyofhoursandearnings/previousReleases> (accessed October 2018)

¹⁶ Living Wage Foundation <https://www.livingwage.org.uk/> (accessed September 2018)

¹⁷ Office for National Statistics (ONS). *Consumer price inflation tables*. <https://www.ons.gov.uk/economy/inflationandpriceindices/datasets/consumerpriceinflation> (Accessed June 2018).

¹⁸ Office for National Statistics (ONS). *Relationship between: Standard Occupational Classification 2010 (SOC2010) and Standard Occupational Classification 2000 (SOC2000). Classification and Harmonisation Unit User Guide 2010*. Newport: ONS; 2010. Available from: <https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassification/soc/soc2010> (Accessed October 2018)

¹⁹ Keen M. *ONS Occupational Classifications Department*. Personal communication, March 2018

²⁰ Scottish Household Survey: <https://www.gov.scot/Topics/Statistics/16002> (accessed September 2018)

²¹ The Equality Trust. *How is Economic Inequality Defined?* <https://www.equalitytrust.org.uk/how-economic-inequality-defined> (Accessed October 2018)

- ²² Regidor E. Measures of health inequalities: parts 1 and 2. *Journal of Epidemiology & Community Health* 2004;58:858-861 and 900-3.
- ²³ UK Government Department of Work & Pensions (DWP). *Family Resources Survey 2016/17*. London: DWP; 2018. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/692141/family-resources-survey-2016-17-background-note-and-methodology.pdf (Accessed October 2018)
- ²⁴ Chanfreau J, Burchardt T. *Equivalence scales: rationales, uses and assumptions*. Edinburgh: Scottish Government; 2008. Available from: <https://www2.gov.scot/Resource/Doc/933/0079961.pdf> (accessed October 2018).
- ²⁵ Smith R. *Gender pay gap in the UK: 2018*. Newport: ONS; 2018. Available at: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/bulletins/genderpaygapintheuk/2018> (Accessed October 2018)
- ²⁶ McGuinness F, Pyper D. *The Gender Pay Gap. House of Commons Library Briefing paper No. 7068*. London: House of Commons Library; 2018.
- ²⁷ Scottish Parliament. *Gender Pay Gap and Equal Pay Report 2016*. Edinburgh: Scottish Parliament; 2016.
- ²⁸ Scottish Government. *The Gender Pay Gap in Scotland: Update and Analysis of Time-Series Data*. Edinburgh: Scottish Government; 2017
- ²⁹ OECD. *Income Distribution Database (IDD): Gini, poverty, income, Methods and Concepts*. <http://www.oecd.org/social/income-distribution-database.htm> (accessed August 2018)
- ³⁰ Hood A, Waters T. *Living standards, poverty and inequality in the UK: 2017–18 to 2021–22*. London: Institute for Fiscal Studies (IFS); 2017
- ³¹ Reed H, Stark G. *Forecasting Child Poverty in Scotland*. Edinburgh: Scottish Government; 2018. Available at: <https://www.gov.scot/publications/tackling-child-poverty-delivery-plan-forecasting-child-poverty-scotland/> (accessed August 2018)
- ³² Scottish Government. *Poverty and Income Inequality in Scotland: 2015/16*. Edinburgh: Scottish Government; 2017. Available from: <https://www.gov.scot/publications/poverty-income-inequality-scotland-2015-16/> (accessed September 2018)
- ³³ Kuhl A. *Wealth and Assets in Scotland 2006-2014*. Edinburgh: Scottish Government; 2017. Available from: <https://www.gov.scot/publications/wealth-assets-scotland-2006-2014> (accessed October 2018)
- ³⁴ Scottish Government. *New Perspectives on the Gender Pay Gap: Trends and Drivers*. Edinburgh: Scottish Government; 2016. Available from: <https://www.gov.scot/publications/new-perspectives-gender-pay-gap-trends-drivers/> (accessed September 2018).

- ³⁵ Costa Dias M, Elming W, Joyce R. *The gender wage gap: IFS Briefing Note BN186*. London: IFS; 2016.
- ³⁶ Cribb C. *Public sector pay: still time for restraint? IFS Briefing Note BN216*. London: IFS; 2017. Available at: <https://www.ifs.org.uk/uploads/publications/bns/BN216.pdf> (accessed October 2018)
- ³⁷ One Scotland (Scottish Government). 50-50 by 2020. <https://onescotland.org/equality-themes/5050-by-2020/> (accessed September 2018)
- ³⁸ Scottish Government. *Policy: gender equality*. <https://beta.gov.scot/policies/gender-equality/> (accessed September 2018)
- ³⁹ Clarke S, Bangham G. *Counting the hours: Two decades of changes in earnings and hours worked*. London: Resolution Foundation; 2018. Available at: <https://www.resolutionfoundation.org/app/uploads/2018/01/Counting-the-hours.pdf> (accessed September 2018)
- ⁴⁰ Harkins C, Egan J. *The rise of in-work poverty and the changing nature of poverty and work in Scotland: what are the implications for population health?* Glasgow: GCPH; 2013. Available at: https://www.gcph.co.uk/assets/0000/4018/In-work_poverty_FINAL_Oct.pdf (Accessed October 2018)
- ⁴¹ Living Wage Scotland. <https://scottishlivingwage.org/> (accessed September 2018)
- ⁴² Scottish Government. *NHS Scotland pay rise 2014/2015 media release*. <https://news.gov.scot/news/nhs-scotland-pay-rise> (accessed September 2018)
- ⁴³ Cribb J, Emmerson C. *Workplace Pensions and Remuneration in the Public and Private Sectors in the UK. IFS Briefing Note BN151*. London: IFS; 2014. Available at: <https://www.ifs.org.uk/uploads/publications/bns/bn151.pdf> (accessed September 2018)
- ⁴⁴ van Wanrooy B, Bewley H, Bryson A, Forth J, Freeth S, Stokes L, Wood S. *The 2011 Workplace Employment Relations Study*. Swindon: ESRC; 2013. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/336651/bis-14-1008-WERS-first-findings-report-fourth-edition-july-2014.pdf (accessed October 2018)
- ⁴⁵ Petkova Y. *Contracts that do not guarantee a minimum number of hours: April 2018*. Newport: ONS; 2018. Available from: <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/contractsthatdonotguaranteeaminimumnumberofhours/april2018/pdf> (Accessed October 2018)
- ⁴⁶ Cribb J, Johnson P. *10 years on - have we recovered from the financial crisis?* Weblog. <https://www.ifs.org.uk/publications/13302> (accessed November 2018)
- ⁴⁷ Scottish Government. *Delivering for Today, Investing for Tomorrow: The Government's Programme for Scotland 2018-19*. Edinburgh: Scottish Government; 2018. Available at:

<https://www.gov.scot/publications/delivering-today-investing-tomorrow-governments-programme-scotland-2018-19/>

⁴⁸ Scottish Government. *National Performance Framework*. <http://nationalperformance.gov.scot/> (accessed October 2018)

⁴⁹ Scottish Government. *Ministerial Task Force on Health Inequalities: Equally Well review 2013*. Edinburgh: Scottish Government; 2014. Available from: <https://www.gov.scot/publications/report-ministerial-task-force-health-inequalities-2013/> (accessed October 2018)