

Why is the Gender Pay Gap Higher in the Private Sector?*

Mark B Stewart
University of Warwick

November 2014

Abstract

The gender pay gap in Britain is much higher in the private sector than in the public sector – more than double on the ONS headline measure. This paper examines this difference in gender pay gaps and asks to what extent it is due to compositional differences between the sectors. When the counterfactual for the private sector is based on the whole of the public sector, about one-fifth of the difference between the median gender pay gaps in the private and public sectors is attributed to compositional differences.

* The author thanks the Office for National Statistics and the UK Data Archive for permission to use the Annual Survey of Hours and Earnings and New Earnings Survey data and the Secure Data Service for access. Responsibility for the analysis and interpretation of the data is solely that of the author.
Address for correspondence: Economics Department, University of Warwick, Coventry, CV4 7AL, UK.
E-mail: Mark.Stewart@warwick.ac.uk.

1. Introduction

The fact that the gender pay gap in Britain is much higher in the private sector than the public sector is fairly well known and is often commented on in the media. The reasons for the difference are less often addressed. This paper investigates this difference between the sectors and the factors that influence it; and additionally addresses some obvious supplementary questions. To what extent is this difference between the sectors the result of compositional differences? Is it true across the whole of the wage distribution? Is it true for all age groups? Is it true for some types of job and not for others? There is less evidence available in the public domain about these supplementary issues. This paper first provides evidence on various comparisons between the sectors, and then goes on to examine the extent to which compositional differences between the sectors can explain this difference in gender pay gap between the sectors.

2. Gender pay gaps in the private and public sectors

The headline measure of the gender pay gap favoured by the Office for National Statistics (ONS) is the percentage difference in median hourly earnings (excluding overtime) of full-time employees. For 2013 this is 9.3% in the public sector and 19.3% in the private sector. That is to say women earn 9.3% less than men in the public sector and 19.3% less in the private sector on this measure. The gender pay gap in the private sector is more than double that in the public sector.

This measure of pay, median hourly earnings (excluding overtime) of full-time employees, is seen by ONS as providing the most appropriate comparison between men and women (see Hicks and Thomas, 2009). The choice is motivated by the fact that women are far more likely to work part-time than men and that men work more overtime hours than women. The hourly earnings measure is chosen over weekly earnings since, even among full-timers, women work fewer hours per week than men. The gap in the median is preferred for the headline figure by ONS because it is less susceptible to the influence of extreme values (particularly those at the top of the wage distribution) than the mean. This ONS headline measure will be used as the main measure of the gender pay gap in this paper too, but the mean of the same hourly

earnings measure will also be looked at, as will the equivalent measure for all (not just full-time) employees, and as will gender pay gaps at different percentiles in the wage distribution.

The gender pay gap figures quoted above are calculated from the Annual Survey of Hours and Earnings (ASHE). This is the most accurate and comprehensive data source for data on individual earnings available for Britain. The earnings statistics presented throughout this paper are based on this data source. The ASHE, developed from the earlier New Earnings Survey, is conducted in April of each year. It surveys all employees with a particular final two digits to their National Insurance numbers who are in employment and hence aims to provide a random sample of employees in employment. The ASHE is based on a sample of employees taken from HM Revenue and Customs PAYE records. Information on earnings and paid hours is obtained in confidence from employers, usually downloaded directly from their payroll computer records. It therefore provides very accurate information on earnings and paid hours. Indeed providing accurate information to the survey is a statutory requirement on employers under the Statistics of Trade Act. Technical details of the ASHE are given in Bird (2004).

The gender pay gaps given above are the percentage differentials in median hourly earnings (excluding overtime) between women and men full-time employees. The gaps are therefore for a particular pay measure and a particularly defined employee group. The gender pay gaps by sector for various definitions are given in Table 1. Classification as public or private sector depends on who controls the general corporate policy of the body concerned and is done by the ONS on the basis of the criteria set out in the European System of Accounts 1995. The gender pay gap for the private sector is in all cases larger than that for the public sector. For hourly earnings excluding overtime of full-time employees, the gender gaps in means are larger than those in medians. That for the private sector (21.0%) is again much larger than that for the public sector (13.3%), but the difference is reduced. When the gaps for all, rather than just full-time, employees are considered, the gender pay gaps in both sectors rise (26.9% and 17.3%), but the difference is again slightly reduced. The inclusion of overtime in the hourly earnings measures has relatively little effect on the gender pay gaps in either sector. For the weekly and annual pay measures once again the gender pay gap for the private sector is much larger than that for the public sector, but the difference is again slightly reduced.

The vast majority of those in the ‘neither’ category in the table are employed in a non-profit body or mutual association. In all cases the gender pay gap for this sector lies between those for the private and public sectors. For the hourly pay measures in Table 1 the gender pay gap for this sector is closer to that for the private sector.

One reason gender pay gaps are higher in the private sector is likely to be compositional differences. Gender pay gaps differ across occupations for example and the occupational mix differs between the two sectors. It is likely though that there are also non-compositional reasons for the difference in gender pay gaps. Pay setting methods differ between the sectors. Pay systems are more structured in the public sector. Wage transparency is likely higher among public sector employees. In many cases public sector pay rates are public information. Importantly job evaluations for equal pay assessment are more likely to occur in the public sector than in the private sector. A major test case of equal job evaluation is currently being brought against the supermarket chain Asda. The case is being pursued by the same law firm who won a landmark £1bn Supreme Court ruling two years ago for lower-paid women employed by Birmingham City Council. A member of the legal team was quoted in the press recently as saying: “There has been huge advancement in the public sector. But in the private sector it is still the 1970s. Job evaluations don’t happen.” (The Guardian, 11 April 2014)

When percentile points of the wage distributions are considered, the general picture is similar to that described above for medians and means. Gender pay gaps are higher in the private sector than the public sector, but the sector difference between the gender pay gaps varies across the distribution. Hourly pay gender pay gaps at decile points are given in Table 2. For the gaps for full-time employees only (the left-hand part of the table), that for the private sector is higher than that for the public sector at all decile points, but the difference narrows considerably at the bottom end of the distribution. At the bottom decile point the gender pay gap in the private sector is 9.3% compared with 7.5% in the public sector, a difference of 1.8 percentage points, compared with 10 percentage points at the median. However when gender pay gaps for all employees are considered (the right-hand part of the table), the gap for the private sector falls below that for the public sector for the bottom two decile points. The change is particularly marked at the bottom decile point where the private sector gender pay gap is 6.5% compared to 15.7% in the public sector.

Examination of the ASHE individual-level microdata is useful at this point, but this is available to researchers at the Secure Data Service only for Great Britain (GB) rather than the United Kingdom (UK). (The figures quoted above are all for the UK.) The analysis of the microdata presented here is therefore for GB. Gender pay gaps in hourly pay across the distribution by sector are plotted in Figure 1 for full-time employees and Figure 2 for all employees.

For full-time employees the private sector gender pay gap is rising pretty much throughout the distribution. It is close to zero at the bottom end of the distribution, passes 10% at the 12th percentile and 20% at the 69th percentile. The gender pay gap in the public sector is similar to that in the private sector at the very bottom and very top of the distribution, but is below it and fairly flat across the distribution in between. It is around 10% between about the 10th and 80th percentiles, but then rises sharply in the top one-fifth of the distribution.

At the median the gender pay gap is 19.0% in the private sector and 9.8% in the public sector, a difference of 9.2 percentage points. (Remember these are gaps for GB and differ slightly from those for the UK.) At the lower quartile point the difference is about half this. The gender pay gap is 15.2% in the private sector there and 10.0% in the public sector, a difference of 5.2 percentage points. The difference at the upper quartile point, in contrast, is very similar to that at the median. The gender pay gap there is 20.5% in the private sector and 9.9% in the public sector, giving a difference of 10.6 percentage points.

When we look at the corresponding figure for all employees, full-time and part-time (Figure 2), there are a number of differences. First the public and private sector profiles cross, with the public sector gender pay gap being above that in the private sector for percentiles below the 27th. Second the private sector gender pay gap rises faster than that for full-time employees only, passing 10% at the 13th percentile, similarly to that for full-time employees only, but then passing 20% much earlier at the 29th percentile and then 30% at the 90th. Third the public sector gender pay gap declines slightly in the middle section of the distribution, falling from 21% at the 30th percentile to 14% at the 70th.

At the median the gender pay gap is 26.7% in the private sector and 17.7% in the public sector, a difference of 9.0 percentage points. (Remember these are gaps for GB and differ slightly from those for the UK.) At the lower quartile point the gender pay gaps are almost

equal: 18.3% in the private sector and 18.6% in the public sector. In contrast at the upper quartile point the difference is wider than at the median. The gender pay gap there is 29.1% in the private sector and 14.2% in the public sector, giving a difference of 14.9 percentage points.

It is also informative to consider a slightly finer sectoral breakdown, distinguishing between those employed by central government and by local authorities. This is presented in Figure 3. Central government includes government departments and their executive agencies, non-departmental public bodies, and any other non-market bodies controlled and mainly financed by them. The local authorities classification includes those types of public administration that only cover a specific locality and any non-market bodies controlled and mainly financed by them. It includes for example police and fire authorities and transport authorities. In the public sector in 2013, 47.5% of full-time employees worked for central government and 43.5% worked for local authorities. (These are the percentages in the ASHE sample.) The remaining 9% worked for public corporations and are excluded from the analysis in these two figures. The public corporations category includes such bodies as the Bank of England, Transport for London, and the Land Registry.

The gender pay gap for full-time employees in central government is about 5 percentage points below that in the private sector between about the 35th and 70th percentiles. It then rises rapidly overtaking that for the private sector at the 84th percentile and is above it for roughly the top one-sixth of the distribution. The gender pay gap in local authorities in contrast, while similar to that in central government up to about the 40th percentile, then falls for the central part of the distribution before rising for the top one-fifth of the distribution, although even in that upper part it remains beneath that for both central government and the private sector.

At the median the gender pay gap is 14.3% in central government and lower at 8.6% in local authorities, compared with 19.0% in the private sector. Thus it is 4.7 percentage points below for central government and 10.4 percentage points below for local authorities. At the lower quartile point the gender pay gap is similar in the central government and local authority sectors and the difference from the private sector lower than at the median. The gender pay gap is 12.0% in central government and 12.4% in local authorities, compared with 15.2% in the private sector, giving differences of 3.2 and 2.8 percentage points respectively. The gender pay gap at the upper quartile point is higher than at the median for central

government and lower than at the median for local authorities, while that for the private sector is about the same as at the medians. The gender pay gap is 16.6% in central government and 4.0% in local authorities, compared with 20.5% in the private sector, giving differences of 3.9 and 16.5 percentage points respectively.

To sum up, beyond the headline difference between the gender pay gaps in the public and private sectors, there is also variation in this difference across the distribution, between central government and local authorities, and according to whether or not part-time employees are included in the analysis. On the ONS headline measure the gender pay gap in the private sector is more than double that in the public sector. For other measures of pay the median and mean gender pay gaps are all higher in both sectors, but slightly closer together. However in all cases the private sector gender pay gap is considerably greater than that in the public sector. The gender pay gap in the private sector also rises more as we move up the central part of the distribution than does that in the public sector. On the main measure the difference between the gender pay gaps in the two sectors is about half as large at the lower quartile point as it is at the median.

There are also some marked differences between central government employees and those of local authorities. At the medians the difference between the gender pay gaps in the private sector and local authorities is twice that between the private sector and central government. This difference widens when we move further up the distribution when the comparison is with local authorities employees. When the comparator is central government the difference in gender pay gaps with the private sector is similar at the lower quartile point, median and upper quartile point. When the comparator is local authorities, the difference rises from 3 percentage points at the lower quartile point to 10 percentage points at the media, to 16 percentage points at the upper quartile point.

3. Further variation in these private and public sector gender pay gaps

Gender pay gaps (and the private-public sector differences between them) potentially differ by individual and job characteristics such as age, collective agreement, company size and occupation among others. To illustrate this, median gender pay gaps in the public and private sectors and overall, broken down by each of these variables, are given in Table 3. The

left-hand half of the tables gives these gaps for full-time employees only and the right-hand half gives them for all employees.

For all subgroups by age, collective agreement coverage and company size the gender pay gap is higher in the private sector than the public sector, and this holds true whether attention is restricted to full-time employees only or not. Gender pay gaps are higher for those aged 40 and over than they are for those below 40 in both sectors. The gap rises with age through the groups and then falls for those of 50 and above in both sectors for all employees, but only in the public sector when full-time employees only are considered.

Overall the gender pay gap is lower when employees' pay is set with reference to a collective agreement than when it is not, and this is also true in the public sector. However the reverse holds true in the private sector. Here gender pay gaps for those covered by collective bargaining are higher than for those who are not.

The picture with respect to company size is a rather mixed one. Overall gender pay gaps are higher in companies with 20,000 or more employees than in those with fewer than this, but the relationship with size is not a monotonic one below this threshold. However this picture is then not exhibited in some regard in either the public or the private sector. When all employees are considered, the gender pay gap is lower above this threshold in both sectors. When only full-time employees are considered, it holds true only in the private sector and there only just.

Within occupational major groups (using Standard Occupational Classification 2010) it is not universally the case that the private sector gender pay gap exceeds that in the public sector, although it is true in the majority of groups. When considering full-time employees only, the private sector gender pay gap is lower than that in the public sector for associate professional and technical occupations (major group 3) and sales and customer service occupations (major group 7). When all employees are considered this is true for both these groups and additionally for skilled trades occupations (major group 5) and elementary occupations (major group 9).

Comparing across occupational subgroups, for both all employees and full-time employees only and in both sectors and overall, gender pay gaps are highest for those in skilled trades

occupations (major group 5). In the private sector the next highest gender pay gap is for managerial occupations (major group 1), followed by operatives (major group 8). However the picture is not the same in the public sector. There associate professional and technical occupations (major group 3) is more prominent. And when considering full-time employees only, the gender pay gap for operatives is negative. Thus the picture is considerably more complex when we look at occupational subgroups.

Thus there is considerable variation in gender pay gaps in the private and public sectors, and in the difference between them, across the various subgroups considered here. In combination with this there are also differences between the two sectors in the compositional mix with respect to these individual and job characteristics. The vast majority of those employed in the public sector are covered by a collective agreement, whereas only a minority of those in the private sector are. Company size is typically larger for those who work in the public sector. Public sector employees are on average older than those in the private sector. And finally a larger proportion of the jobs in the public sector are in occupation major groups 2, 3, 4 and 6 than in the private sector and the reverse is true for the other major groups.

4. Estimation of adjusted wage differentials

Wage differentials are often decomposed into a part that is “explained” by a set of factors and a part that is left “unexplained” by these factors. The latter can also be viewed as the “adjusted” wage differential, after removal of the effect of the specified set of factors. Suitable econometric decomposition methods are discussed in the survey by Fortin et al (2011). The classic regression-based decomposition proposed by Oaxaca (1973) and Blinder (1973) is now a standard technique in many areas of applied economics. It provides a method for decomposing the difference in the mean of an outcome variable between two groups or between two time periods and has been applied in a vast array of studies. Most studies that decompose wage differentials analyse the mean differential and apply the Oaxaca-Blinder (OB) decomposition.

This analysis in this paper focuses more on median differentials and those at other distributional points. However consider first the decomposition or adjustment of the mean

wage gap between two groups, A and B . For simplicity of exposition, the outcome variable of interest, y , is the log(wage). The estimated raw or overall mean wage gap is given by

$$\hat{\Delta}_o^\mu = \bar{y}_A - \bar{y}_B$$

If group A is women and group B men, then this is approximately the (negative) gender mean wage gap. Alternatively if A and B are the private and public sectors, then this is approximately the mean wage differential between them. Alternatively y itself might be the gender pay gap in a sector and then this difference is the inter-sector difference in gender pay gaps.

In the OB approach linear regression models are specified for the log(wage) in each group

$$y_g = x' \beta_g + \varepsilon_g \quad g = A, B$$

The estimated raw mean wage gap can therefore also be written as

$$\hat{\Delta}_o^\mu \equiv \bar{y}_A - \bar{y}_B = \bar{x}_A' \hat{\beta}_A - \bar{x}_B' \hat{\beta}_B$$

One form of the OB decomposition can then be written as

$$\hat{\Delta}_o^\mu \equiv \bar{y}_A - \bar{y}_B = (\bar{x}_A - \bar{x}_B)' \hat{\beta}_A - \bar{x}_B' (\hat{\beta}_A - \hat{\beta}_B)$$

The first term, $\hat{\Delta}_x^\mu = (\bar{x}_A - \bar{x}_B)' \hat{\beta}_A$, is the “explained” part of the gap, also known as the composition effect. The second term, $\hat{\Delta}_s^\mu = \bar{x}_B' (\hat{\beta}_A - \hat{\beta}_B)$, is the “unexplained” part of the gap, also known as the wage structure effect. This component is the “adjusted wage gap” (after adjusting for the effect of the x -variables).

This “unexplained” component of an OB decomposition can also be interpreted as a “treatment effect” of the type that has been extensively studied in the program evaluation literature. (Specifically it is the average treatment effect on the treated (ATT)) Fortin et al (2011) stress the usefulness of this link “to (i) clarify the assumptions underneath popular decomposition methods, (ii) propose estimators for some of the elements of the

decomposition, and (iii) obtain formal results on the statistical properties of the various decomposition terms”.

There are several useful ways of viewing this decomposition and resulting adjusted wage gap. First, the adjusted wage gap combines the coefficient differences between the two groups using the group B means, i.e. the means of the “control” or “reference” group. Second, in the explained part, the composition effects of the x -variables are combined together using the group A coefficients in the adjustment for compositional differences, i.e. the coefficients of the “treatment” or “subject” group.

Third, the adjusted wage gap can also be written as

$$\hat{\Delta}_s^\mu \equiv \bar{x}'_B(\hat{\beta}_A - \hat{\beta}_B) = \bar{x}'_B\hat{\beta}_A - \bar{x}'_B\hat{\beta}_B = \hat{y}_A^C - \bar{y}_B$$

where $\hat{y}_A^C = \bar{x}'_B\hat{\beta}_A$, the counterfactual average log wage of group A if they had the average x -values of group B . So in the case of comparing the private sector with the public sector it estimates the counterfactual average if those in the private sector were still paid according to the private sector wage structure, but had the same average characteristics as those in the public sector. Alternatively the counterfactual can be viewed as what the average wage for the public sector would be if those working there were paid according to the private sector wage structure.

The counterfactual average log wage is then compared to the actual group B average log wage. So the adjusted mean wage gap is an estimate of what the mean gap would be if the two groups had the same average characteristics (i.e. x -variables).

Adjusted wage gaps can be constructed more generally using simple re-weighting estimators (also known as inverse probability weighting, inverse propensity weighting or propensity score weighting). For performing a decomposition for distributional statistics, such as here, Fortin et al (2011) in their survey argue that “reweighting is the method of choice” (page 74) because first it is simple to implement and second there are well established results in the program evaluation literature that show that the method is asymptotically efficient (Hirano et al., 2003; Firpo, 2007). The OB estimator of the counterfactual mean can be shown to be a

propensity score reweighting estimator based on a linear model for the conditional odds of being “treated”, i.e. of being a member of group A (Kline, 2011).

Using a reweighting estimator to estimate the counterfactual median and the adjusted median wage gap, the focus is on cumulative distributions, since the median can then be obtained by inversion. The approach constructs a counterfactual distribution which combines the characteristics of group B (e.g. the public sector) with the wage structure of group A (e.g. the private sector). It estimates the wage distribution that group A (e.g. those in the private sector) would have if they had the same distribution of characteristics, x , as group B (e.g. those in the public sector). Alternatively it can be viewed as an estimate of the wage distribution that group B (e.g. the public sector) would have if they were paid like group A (e.g. the private sector) workers.

The method replaces the distribution of the vector of characteristics, x , of group A with the distribution of x of group B by using the re-weighting factor $\Psi(x)$ defined as follows. Construct a dummy variable D_B that takes the value 1 in group B and the value 0 in group A. The re-weighting factor can then be written as

$$\Psi(x) = \frac{\Pr(x | D_B = 1)}{\Pr(x | D_B = 0)} = \frac{\Pr(D_B = 1 | x) / \Pr(D_B = 1)}{\Pr(D_B = 0 | x) / \Pr(D_B = 0)}$$

This can be easily computed by estimating a probability model for $\Pr(D_B = 1 | x)$ and using the predicted probabilities to compute estimates of $\Psi(x)$ for observations in group A. DiNardo et al (1996) suggest estimating a flexible logit model. Hirano et al (2003) propose using a non-parametric logit model, which is a series estimator applied to a logit model involving polynomial terms in the covariates of increasing order.

The steps involved in practical implementation are as follows (Fortin et al, 2011, p.65):

(1) Pool the data for groups A and B and run a logit or probit model for the probability of belonging to group B:

$$\Pr(D_B = 1 | x) = 1 - \Pr(D_B = 0 | x) = 1 - \Pr(\varepsilon > -h(x)\alpha) = \Lambda(-h(x)\alpha),$$

where $\Lambda(\cdot)$ is a normal or logit link function and $h(x)$ is a polynomial or other function of x .

(2) Estimate the reweighting factor $\Psi(x)$ for observations in group A using the predicted probabilities of belonging to group B, $\Pr(D_B = 1 | x)$, and A, $\Pr(D_B = 0 | x) = 1 -$

$\Pr(D_B = 1 | x)$, and the sample proportions in group B , $\Pr(D_B = 1)$, and A , $\Pr(D_B = 0)$, in the expression for $\Psi(x)$ above.

(3) Compute the counterfactual statistic of interest (in this case the median) using observations from the group A sample reweighted using $\Psi(x)$.

The adjusted median wage gap, for example, is then the difference between this estimated counterfactual median and the actual median for group B .

5. Empirical evidence on adjusted differences between the private and public sectors

This section examines how much of the difference between the gender pay gaps in the private and public sectors can be attributed to compositional differences. It examines the counterfactual question of what the distribution of the gender pay gap in the private sector would look like if the private sector had the distribution of explanatory factors (the x -variables of the previous section) found in the public sector. Hence it asks what would the difference in gender pay gap distributions between the two sectors look like if the two sectors had the same distributions of explanatory variables.

The questions are answered using the re-weighting methodology laid out in the previous section. Adjustment is made for the potential explanatory factors examined in Section 3. Age is included in the probability model in a quadratic form. Coverage by a collective agreement is included as a dummy variable. Company size is used in logarithmic form. A set of dummy variables are included for 3-digit occupations (i.e. a much finer classification of occupations than used in Section 3). Some amalgamation of occupation groups is required to ensure sufficient numbers of observations for each gender-sector cell for each occupational group. The rule used here is that there must be at least 30 observations for each gender within each sector for an occupation to stand on its own, and if not then groups are combined until this condition is satisfied.

The counterfactual private sector gender pay gap for full-time employees using the distributions of these explanatory variables in (the whole of) the public sector is given in Figure 4. Several features of this estimated counterfactual are of interest. Below about the 35th percentile the counterfactual gender pay gap is actually above the unadjusted private

sector gender pay gap, i.e. in this range of the distribution the difference in gender pay gap between the private and public sectors is increased by adjusting for differences in the x-variables. Above about the 35th percentile the counterfactual gender pay gap is below the unadjusted private sector gender pay gap. The adjustment for compositional differences reduces the difference between the private and public sector gender pay gaps above this point.

The median unadjusted gender pay gap is 19.0% in the private sector and 9.8% in the public sector. (Remember these are for GB rather than the UK.) The counterfactual median gender pay gap under the counterfactual described above is 17.2%. In other words a difference between the sectors of 9.2 percentage points is reduced by 1.8 points to 7.4 percentage points by adjustment for differences in the explanatory factors between the sectors. So about one-fifth of the original difference at the medians is attributed to the compositional differences captured by the explanatory factors listed above.

The impact of the adjustment for compositional differences increases slightly as we move up the distribution, but is mostly between about 3 and 5 percentage points. At the 80th percentile the unadjusted gender pay gap is 21.4% in the private sector and 11.2% in the public sector. The counterfactual gender pay gap under the counterfactual described above is 18.7%. Thus a difference between the sectors of 10.2 percentage points is reduced by 2.7 points to 7.5 percentage points by adjustment for differences in the explanatory factors between the sectors. So about one-quarter of the original difference at the 80th percentile is attributed to the compositional differences captured by the explanatory factors listed above. There are negligible differences between the counterfactual and the public sector gender pay gaps once we get to about the 90th percentile, i.e. all the difference in gender pay gaps between the sectors is attributable to compositional differences there.

As seen in Section 2 there are important differences in gender pay gaps between central government and local authorities within the public sector. Figures 5 and 6 repeat the analysis shown in Figure 4 but with central government and local authorities respectively used as the comparator for the private sector rather than the whole of the public sector. The same factors are adjusted for. The counterfactual private sector gender pay gap for full-time employees using the distributions of the variables in central government is given in Figure 5. Again adjustment for these factors increases the difference in gender pay gap between the private

sector and the comparator sector below about the 30th percentile. The counterfactual gender pay gap is above the unadjusted private sector gender pay gap up to this.

The median unadjusted gender pay gap is 19.0% in the private sector and 14.3% in central government. The counterfactual median gender pay gap is 18.4%. Thus a difference between the sectors of 4.7 percentage points is reduced by only 0.6 points to 4.1 percentage points by adjustment for differences in the explanatory factors between the private sector and central government. So about one-eighth of the original difference in median gender pay gaps is attributed to these compositional differences.

In this case, with central government as the comparator sector, adjustment for the x-variables has little effect on the private sector gender pay gap at the median, but an increasing effect above that until about the 70th percentile. Then at the 80th percentile the counterfactual gender pay gap is equal to that of central government. So at this point all of the difference between the gender pay gaps in the private sector and central government is due to compositional differences between the sectors.

The counterfactual private sector gender pay gap for full-time employees using local authorities as the comparator sector is given in Figure 6. Again adjustment for the factors listed above increases the difference in gender pay gap between the private and local authority sectors in the bottom part of the distribution. The counterfactual gender pay gap is above the unadjusted private sector gender pay gap below the 35th percentile. The median unadjusted gender pay gap is 19.0% in the private sector and 8.6% in the local authorities sector. The counterfactual median gender pay gap is 14.2%. Thus a difference between the sectors of 10.4 percentage points is reduced by 4.8 points to 5.6 percentage points by adjusting for differences in the explanatory factors between the private and local authority sectors. So nearly half of the original difference in median gender pay gap is attributed to these compositional differences.

The counterfactual gender pay gap is above that for the local authority sector throughout almost the whole distribution. In fact the adjusted gap difference between the two sectors is pretty similar across the distribution. The difference in adjusted gap is 5.6 percentage points at the median and is between 4 and 7 percentage points for most of the distribution – between about the 1st and 7th deciles.

To sum up, when comparison is made with the whole of the public sector, about one-fifth of the difference between the median gender pay gaps in the private and public sectors is attributed to compositional differences. When comparison is made with central government, the difference in unadjusted gender pay gaps is only about half the size and adjustment for compositional differences has little effect on this difference. When comparison is made with local authorities however, nearly half of the (larger) difference in median gender pay gap with the private sector is attributed to compositional differences. In contrast to the median, for all three comparators, in roughly the bottom one-third of the distribution adjustment for compositional differences increases the counterfactual gender pay gap above the unadjusted private sector gender pay gap, i.e. it widens the difference between the gender pay gaps in the private and comparator sectors.

6. Conclusions

On the ONS headline measure the gender pay gap in the private sector is more than double that in the public sector. This paper examines this difference in gender pay gaps and asks to what extent it is due to compositional differences between the sectors. When the counterfactual for the private sector is based on the whole of the public sector, about one-fifth of the difference between the median gender pay gaps in the private and public sectors is attributed to compositional differences.

Within the public sector gender pay gaps also differ considerably between central government and local authorities. At the medians the difference between the unadjusted gender pay gaps in the private sector and local authorities is twice that between the private sector and central government. When the counterfactual for the private sector is based on employees in central government alone, the difference in unadjusted median gender pay gaps is only about half the size and adjustment for compositional differences has little effect on this difference. When the counterfactual for the private sector is based on employees in local authorities however, nearly half of the (larger) difference in unadjusted median gender pay gaps is attributed to compositional differences.

Table 1
Median and mean gender pay gaps by sector, United Kingdom, 2013

	Median			Mean		
	Public sector	Private sector	Neither	Public sector	Private sector	Neither
Hourly pay excluding overtime for full-time employee jobs	9.3	19.3	17.5	13.3	21.0	18.5
Hourly pay excluding overtime for all employee jobs	17.3	26.9	25.1	17.1	24.8	21.8
Gross hourly pay (incl. overtime) for full-time employee jobs	9.1	19.7	17.3	13.2	20.9	18.5
Gross hourly pay (incl. overtime) for all employee jobs	17.3	27.3	25.4	17.1	24.7	21.9
Weekly pay excluding overtime for full-time employee jobs	12.1	21.9	18.3	16.5	23.8	19.5
Gross weekly pay (incl. overtime) for full-time employee jobs	14.0	25.3	18.0	17.9	25.7	19.5
Gross annual pay (incl. overtime) for full-time employee jobs	15.9	26.6	19.0	20.3	28.4	20.9

Notes:

1. Source: Author's calculations from Annual Survey of Hours and Earnings 2013 published tables.

Table 2
Gender pay gaps by sector at decile points, United Kingdom, 2013
Hourly pay, excluding overtime

	Full-time employees			All employees		
	Public sector	Private sector	Neither	Public sector	Private sector	Neither
Percentiles:						
10	7.5	9.3	9.2	15.7	6.5	9.1
20	8.7	14.2	11.0	16.5	15.0	15.5
25	9.1	15.0	12.4	17.8	18.1	17.5
30	9.9	16.1	14.0	19.9	20.8	18.8
40	9.2	17.7	16.5	19.5	24.2	22.9
Median	9.3	19.3	17.5	17.3	26.9	25.1
60	8.7	19.0	17.3	15.9	28.1	24.9
70	9.2	20.0	16.5	13.7	29.1	22.7
75	9.2	20.5	17.9	13.9	29.3	22.8
80	10.7	21.5	17.0	14.7	29.1	22.8
90	18.1	24.4	18.9	20.6	30.2	21.5

Notes:

1. Source: Author's calculations from Annual Survey of Hours and Earnings 2013 published tables.

Table 3
Median gender pay gaps in subgroups by sector, Great Britain, 2013
Hourly pay, excluding overtime

	Full-time employees			All employees		
	Public sector	Private sector	All	Public sector	Private sector	All
All	9.8	19.0	10.3	17.7	26.7	20.0
Age < 30	-1.6	8.1	1.4	-1.2	13.2	8.2
Age 30 – 40	4.6	5.9	1.3	10.3	19.4	12.4
Age 40 – 50	14.4	23.7	16.3	26.0	32.8	27.1
Age ≥ 50	12.7	25.9	15.8	22.6	31.9	25.1
No collective agreement	16.2	18.3	15.4	21.6	26.4	23.8
Collective agreement	9.3	21.0	6.6	17.4	28.1	16.8
Company size < 1,000	9.1	15.2	12.0	20.5	22.4	20.0
1,000 – 5,000	12.1	19.8	11.2	14.2	30.4	19.0
5,000 – 20,000	10.2	26.6	11.6	18.9	34.3	21.0
≥ 20,000	9.6	26.8	15.2	16.9	26.2	24.4
Occupation major group:						
Managerial	12.1	24.8	17.7	14.1	25.8	20.1
Professional	10.7	13.4	9.6	10.6	13.8	9.2
Associate professnl. & technical	13.0	11.3	12.3	15.5	12.9	14.2
Administrative & secretarial	7.1	9.0	7.9	9.9	10.2	9.2
Skilled trades	21.8	26.7	24.8	33.3	31.9	30.3
Caring, leisure & other service	1.8	14.1	7.5	5.6	9.2	6.5
Sales & customer service	8.6	5.1	3.6	7.4	7.2	7.0
Process/plant/machine operatives	-6.7	22.5	21.9	12.6	22.4	21.6
Elementary	3.5	14.2	15.8	26.9	12.7	13.7

Notes:

1. Source: Author's calculations from Annual Survey of Hours and Earnings 2013 microdata.

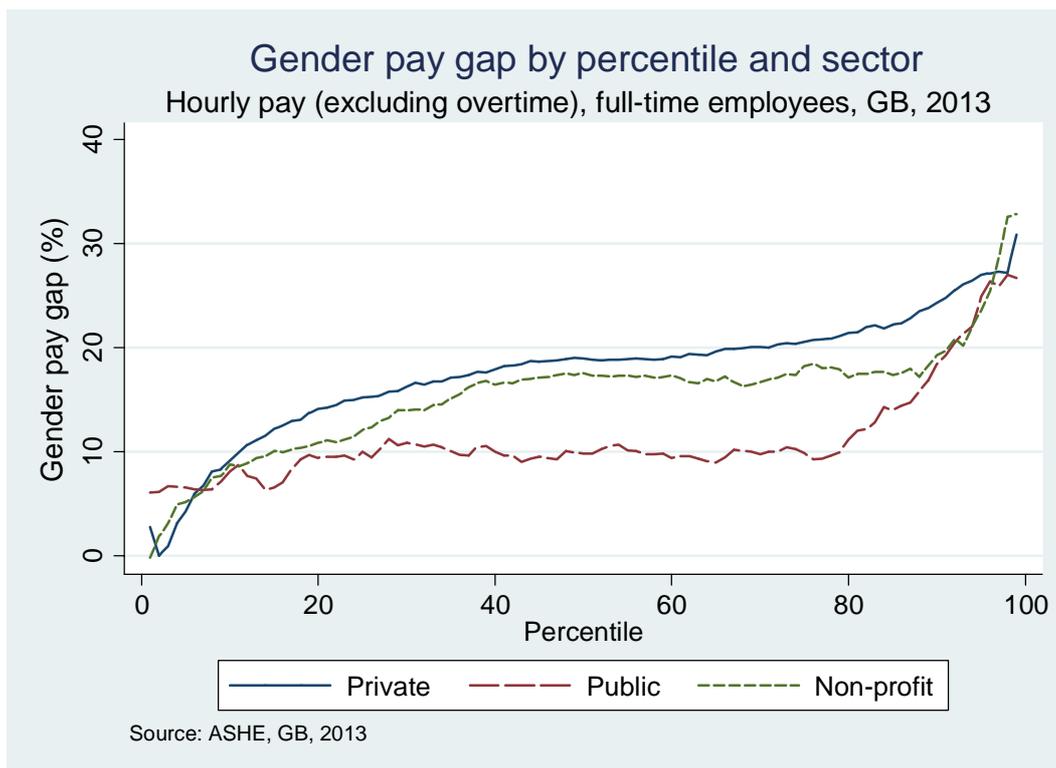


Figure 1
Gender pay gap by percentile and sector, full-time employees.

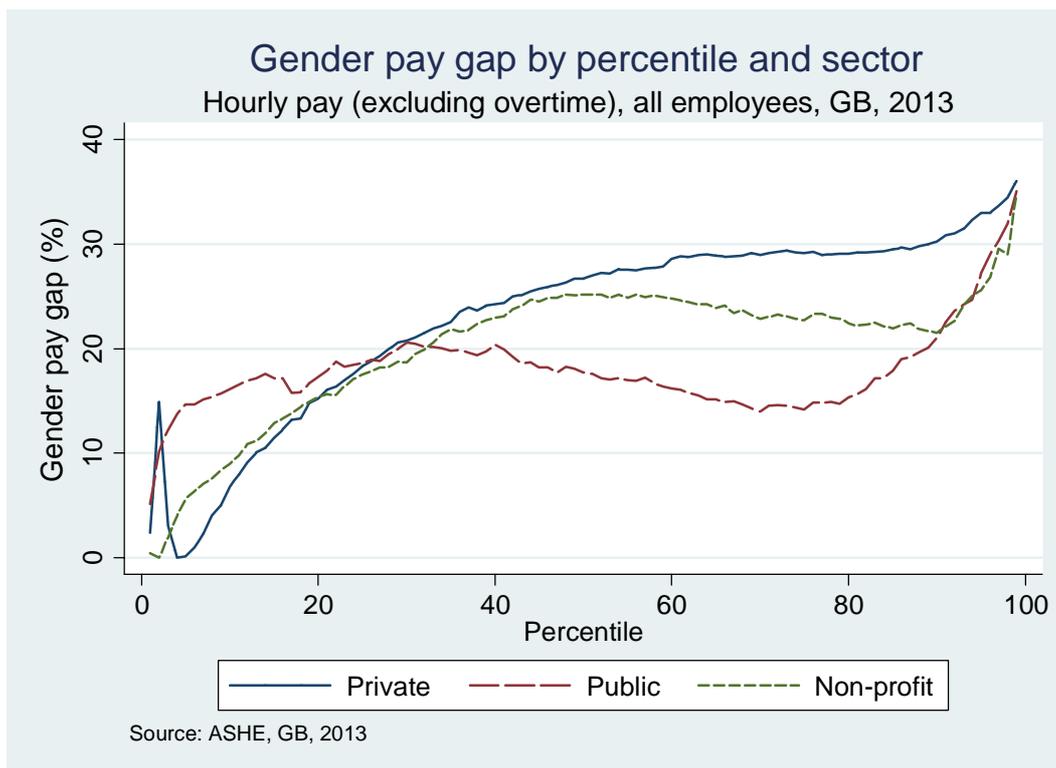


Figure 2
Gender pay gap by percentile and sector, all employees.

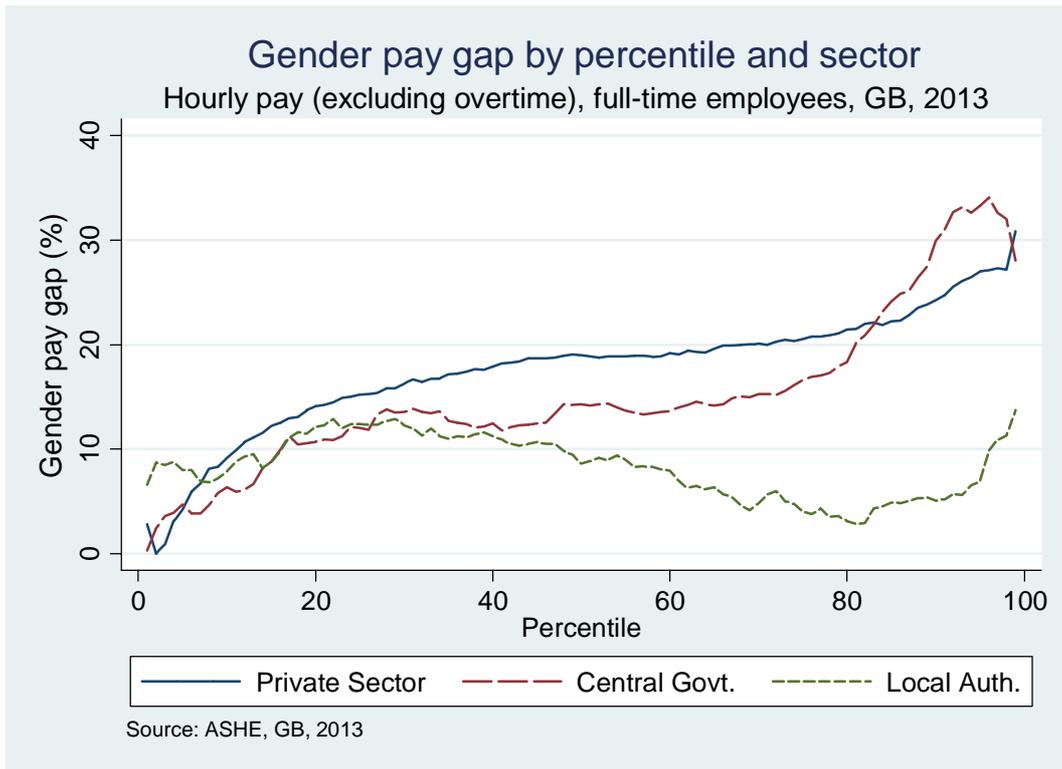


Figure 3
Gender pay gap by percentile for private sector, central government and local authorities.

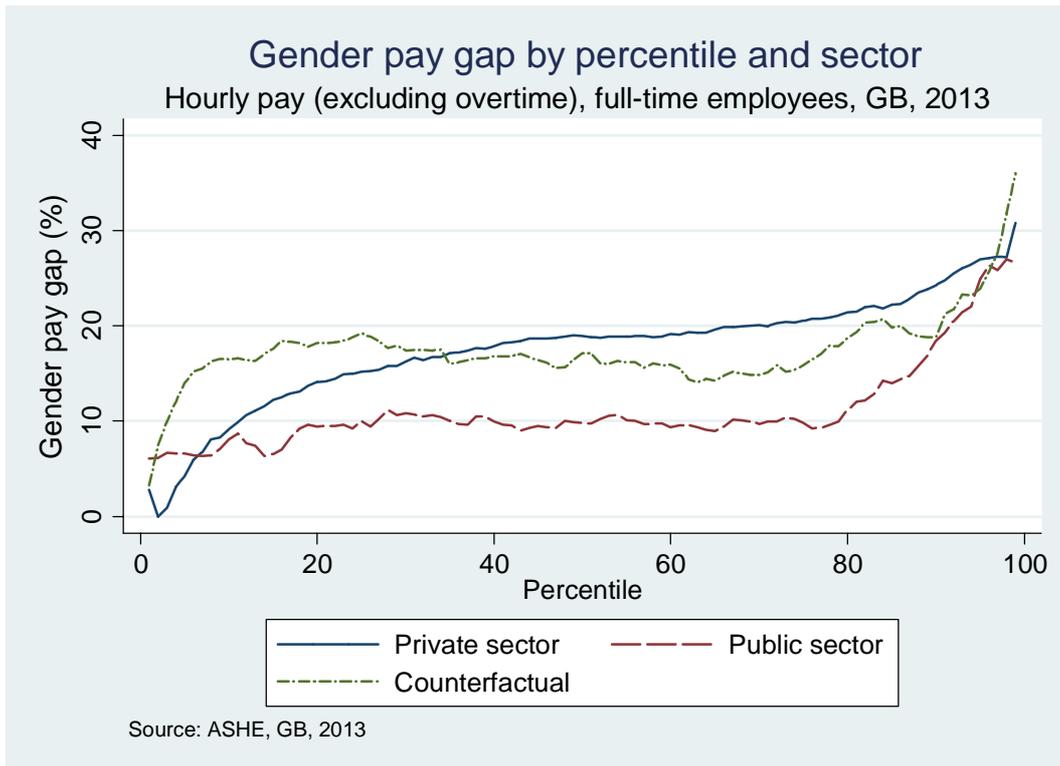


Figure 4
Adjusted private sector gender pay gap when the counterfactual is based on the characteristics of employees of the whole of the public sector.

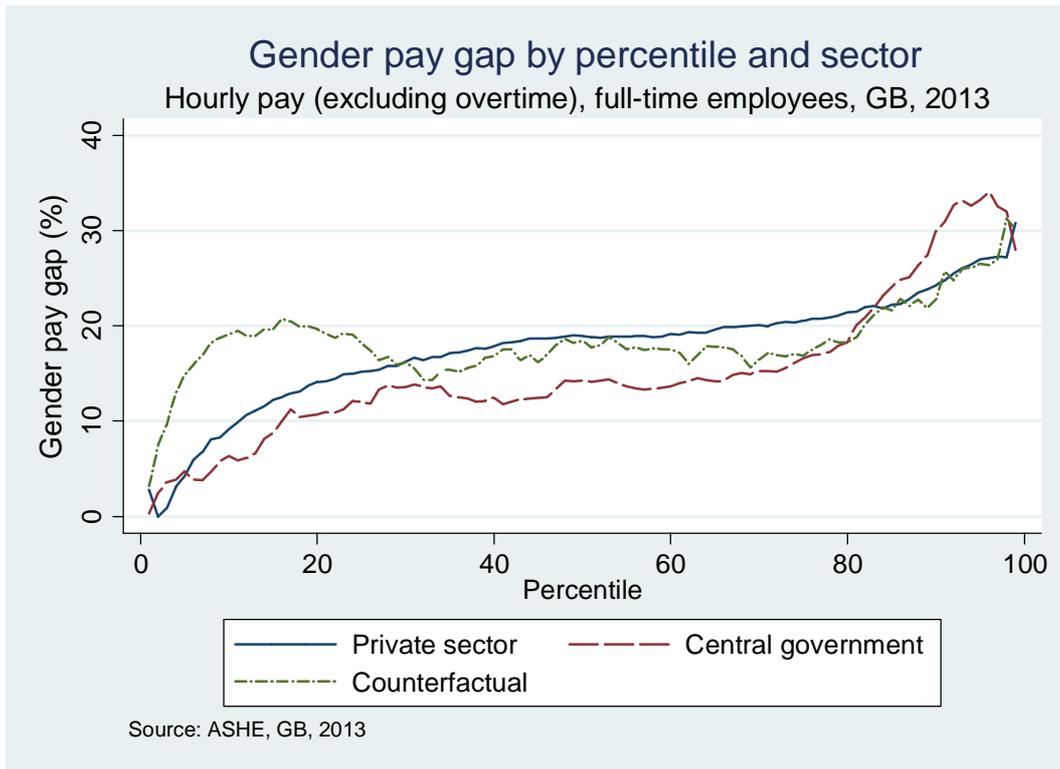


Figure 5
Adjusted private sector gender pay gap when the counterfactual is based on the characteristics of central government employees.

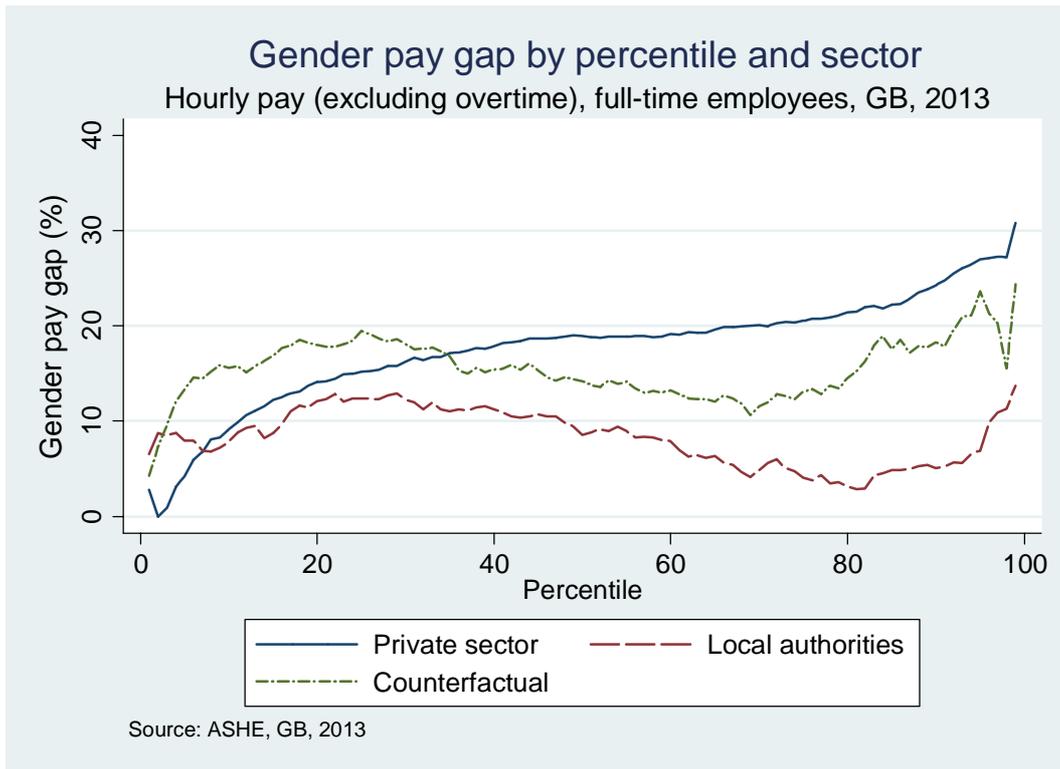


Figure 6
Adjusted private sector gender pay gap when the counterfactual is based on the characteristics of local authorities employees.

References

- Altonji, Joseph G. and Blank, Rebecca M. (1999), “Race and gender in the labor market”, in *Handbook of Labor Economics*, Volume 3, Edited by O. Ashenfelter and D. Card, Elsevier Science.
- Bertrand, Marianne (2011), “New perspectives on gender”, *Handbook of Labor Economics*, Volume 4b, Edited by O. Ashenfelter and D. Card, Elsevier Science
- Bird, D. (2004). “Methodology for the 2004 Annual Survey of Hours and Earnings”, *Labour Market Trends*, November, 457-464.
- Blinder, Alan (1973). “Wage discrimination: reduced form and structural estimates”, *Journal of Human Resources*, 8, 436–455.
- DiNardo, John, Fortin, Nicole M. and Lemieux, Thomas (1996). “Labor market institutions and the distribution of wages, 1973-1992: a semiparametric approach”, *Econometrica*, 64, 1001–1044.
- Firpo, Sergio (2007). “Efficient semiparametric estimation of quantile treatment effects”, *Econometrica*, 75, 259–276.
- Fortin, Nicole, Lemieux, Thomas and Firpo, Sergio (2011). “Decomposition methods in economics”, in *Handbook of Labor Economics*, Volume 4a, edited by Ashenfelter and Card, Elsevier B.V.
- Hicks, Stephen and Thomas, Jenifer (2009). “Presentation of the gender pay gap: ONS position paper”, Office for National Statistics, November.
- Hirano, Kiesuke, Imbens, Guido W., and Ridder, Geert (2003). “Efficient estimation of average treatment effects using the estimated propensity score”, *Econometrica*, 71, 1161–1189.
- Kline, Patrick (2011). “Oaxaca-Blinder as a reweighting estimator”, *American Economic Review*, 101, 532–537.
- Oaxaca, Ronald (1973). “Male-female wage differentials in urban labor markets”, *International Economic Review*, 14, 693–709.