











































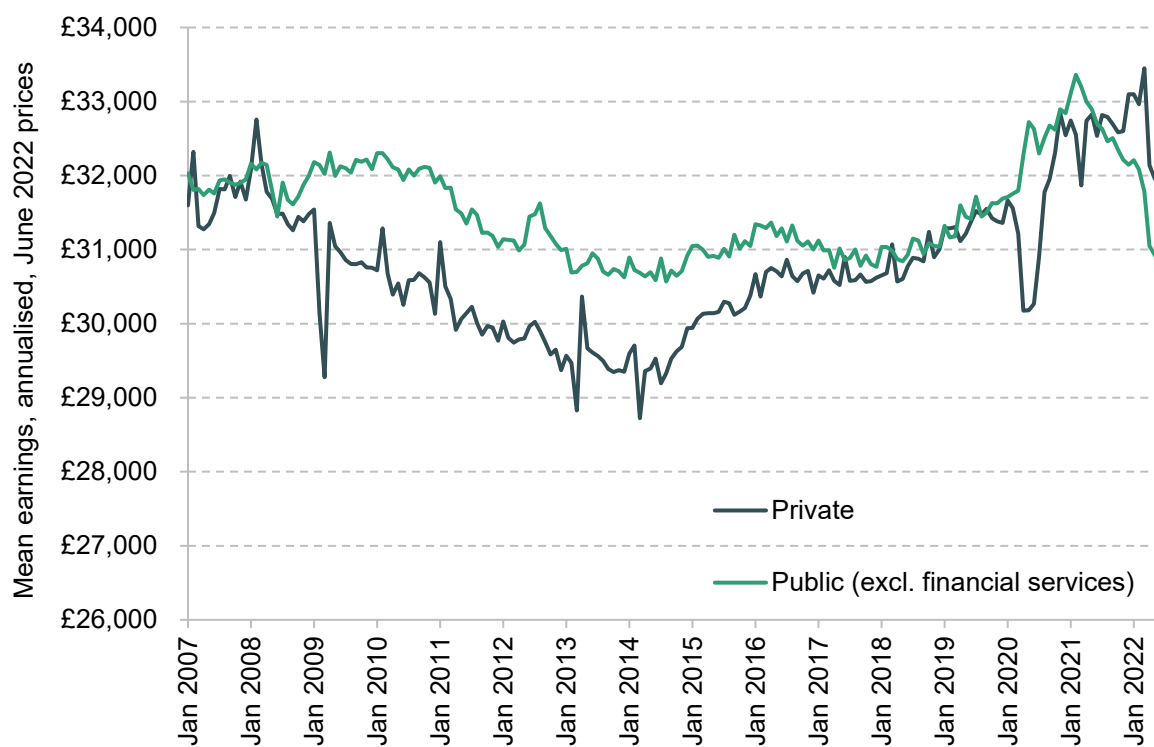


the number of hours worked) stood at £32,102 in the private sector, 4.7% higher than in the public sector (£30,657).<sup>16</sup>

Looking at the trend over time, the lack of growth in average real-terms earnings since the financial crisis is clear: mean public sector earnings in July 2022 were in fact 4.0% lower in real terms than in July 2007. Private sector earnings fared slightly better, but were still only 0.9% higher on average in July 2022 than in July 2007.

A significant gap opened up between average earnings in the two sectors after the financial crisis, with private sector earnings rapidly falling, while public sector earnings stayed relatively stable (as a result of three-year pay agreements made pre-recession being largely honoured). From around 2011, average real-terms earnings were falling in both sectors. After 2014, private sector earnings began to rise again, while public sector earnings remained stagnant, with pay awards capped at an average of 1% across departments between 2013 and 2017.

**Figure 4.4. Real average (mean) annual earnings in the public and private sectors, 2007–22**



Note: Figures shown are the mean weekly earnings in each sector in each month, multiplied by 52.

Source: [ONS average weekly earnings tables](#), deflated using [CPIH](#) (MM23).

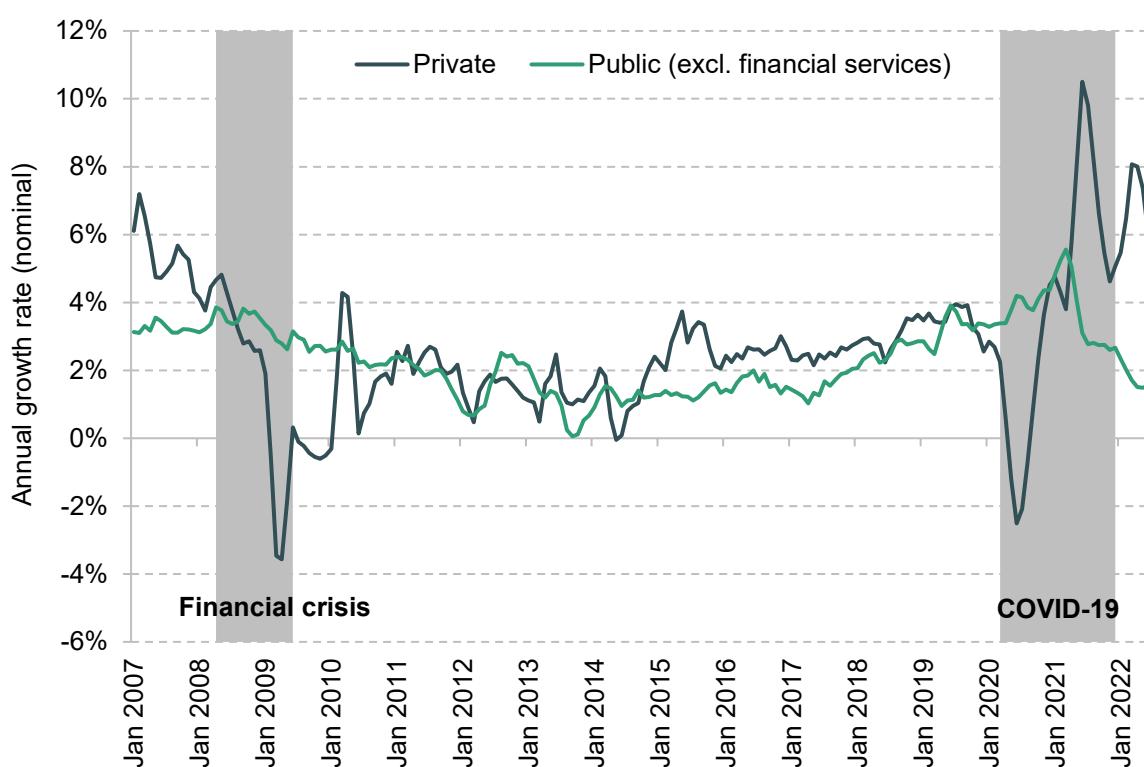
<sup>16</sup> Note that these differences between average earnings in the two sectors reflect both how much employees earn per hour and how many hours they work, with part-time work more prevalent in the public sector. We examine differences in hourly pay later in this section.

Immediately before the COVID-19 pandemic, the raw gap between public and private sector earnings had almost closed (average earnings were 0.6% higher in the public sector in February 2020). In March 2020, following the onset of the pandemic and associated government restrictions, real-terms private sector earnings plummeted, falling 3.3% between March and April, while public sector earnings increased. As happened after the financial crisis, the effects of the economic downturn took longer to be reflected in public sector pay, and were reflected less intensely.

Average earnings in the public sector began to fall sharply in real terms from February 2021, reflecting the freezing of public sector pay in cash terms in 2021–22 for all except those earning under £24,000 and those working in the NHS. Average earnings in the private sector, meanwhile, rebounded strongly in the second half of 2020. From July 2021, average earnings in the private sector were consistently above those in the public sector.

The general lesson here is that the public sector tends to outperform the private sector during downturns (owing to its more stable pay and greater job security), whereas private sector pay typically grows more strongly in the ‘good’ (or inflationary) times. In particular, when the economy is booming or when inflation spikes – as it is currently doing – the greater degree of flexibility in the private sector manifests in stronger pay growth.

**Figure 4.5. Three-month annual growth rates in nominal private and public sector pay since 2007**



Source: Authors' calculations using [ONS average weekly earnings tables](#).

### Box 4.1. Private sector earnings growth during the COVID-19 pandemic

The government furlough programme was taken up almost entirely by private, rather than public, sector employees. Most furloughed employees worked reduced hours, meaning that weekly earnings fell for many private sector employees. As workers came off furlough during 2021 and 2022, and returned to full-time employment, weekly wages mechanically rose, as a result of more hours being worked. This rise in weekly wages is real, but does not capture an underlying increase in hourly wages. When comparing wages in the second half of 2021, or in 2022, with wages a year earlier, they will appear to have risen substantially, since we are comparing a period during which furlough was not prevalent to one during which it was: this is referred to as a ‘base effect’, and leads to private sector earnings growth being overstated.

A ‘composition effect’ also means average private sector wage growth may be biased upwards during the pandemic. Fewer part-time – generally lower-paid – jobs were undertaken during COVID-19, and fewer jobs in elementary occupations. During that time, there were also fewer new entrants to the labour market, who tend to be lower-paid than average. This shift in the composition of the workforce means the private sector contained a larger proportion of higher-paying jobs, which also acted to increase measured average earnings.

Private sector earnings growth figures should therefore be interpreted with caution throughout the COVID-19 period.

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This is evident in Figure 4.5, which shows annual growth rates in nominal earnings over time, by sector. The stronger performance of the public sector in ‘bad’ times is particularly clear. During both the financial crisis and COVID-19 recessions, private sector earnings growth immediately fell, while public sector earnings growth remained relatively stable. But there is also a general tendency for public sector earnings to grow less quickly in ‘good’ times (if any of the period since 2007 can be described as such). Private sector earnings bounced back after both crises, while growth in public sector earnings tended not to keep pace. The pronounced uptick in private sector earnings growth in recent months can also be seen.

Much of the growth in private sector earnings in 2021 and 2022 was underpinned by strong bonus payments. Bonuses were 8.4% of mean private sector total compensation between August 2021 and July 2022 (up from 7.5% in the same period the year before), while they were 0.4% of mean public sector compensation in this period.

Bonuses are an important way in which private sector employers adjust flexibly to macroeconomic conditions. Banks such as Lloyds Bank and Virgin Money are offering ‘cost of living payments’, with Virgin Money offering their staff earning less than £50,000 a £1,000

payment.<sup>17</sup> Bonuses in other sectors, such as construction, manufacturing and retail, have also been growing strongly – often at an annual rate in excess of 20% – in recent months, indicating that strong growth in bonuses is not limited to sectors such as financial services and has instead become more widespread (Office for National Statistics, 2022). Around a quarter of businesses surveyed by the Bank of England in July 2022 reported that they had given, or were considering giving, one-off payments as a response to retention challenges or the cost of living crisis (Bank of England, 2022). While bonuses are also a tool available to the public sector, they are used much more rarely. This has contributed to the divergence in growth rates between the two sectors over the course of 2022.

## The distribution of earnings

The comparisons so far have used data on average (mean) annual earnings in each sector, which do not capture all differences in public and private remuneration. For one, focusing on weekly or annual earnings captures differences in both hourly pay and the number of hours worked. This is important, given that part-time work is more prevalent in the public sector.<sup>18</sup> In addition, looking only at the average provides no insight into the overall distribution or what is happening at the top and bottom ends of the earnings scale. Figure 4.6 illustrates the public–private differential in hourly wages at deciles of each sector’s wage distribution, allowing us to control for differences in the number of hours worked and to look in more detail at the overall distribution of wages in the public and private sectors.

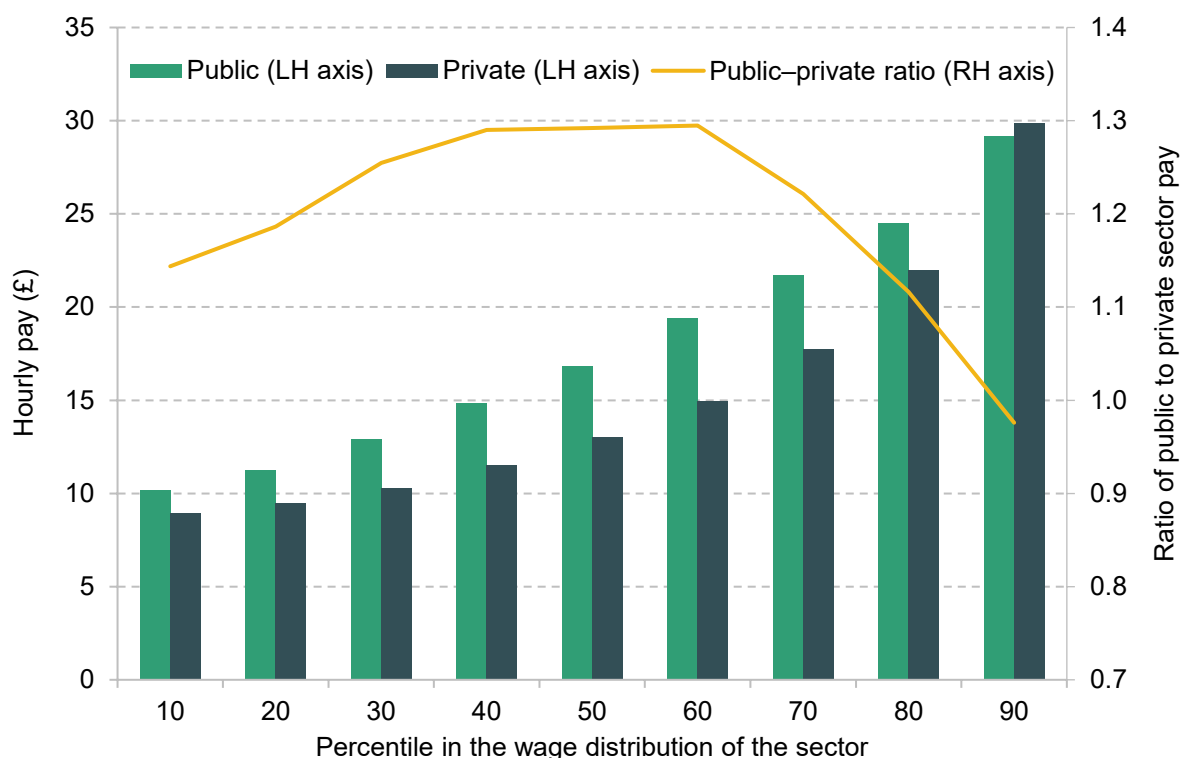
The ratio between public and private sector earnings is not constant over the wage distribution. From the 10<sup>th</sup> to the 80<sup>th</sup> percentiles of the wage distribution in each sector, public sector pay is higher than that in the private sector. For example, someone at the 10<sup>th</sup> percentile of the wage distribution in the public sector earns around 14% more than someone at the 10<sup>th</sup> percentile of the private sector wage distribution; at the median wage (50<sup>th</sup> percentile) in each sector, the public sector employee earns around 29% more, with gross hourly pay in the public sector being £16.81 (equivalent to £35,061 annually for a full-time worker), versus £13.01 in the private sector (equivalent to £27,135 annually). In contrast, at the 90<sup>th</sup> percentile, the ratio falls below 1: those at the top of the private sector earnings distribution earn more than those at the top of the public sector earnings distribution. Gross hourly pay at the 90<sup>th</sup> percentile of the public sector pay distribution is £29.16 (equivalent to £60,819 annually), compared with £29.88 at the 90<sup>th</sup> percentile of the private sector pay distribution (equivalent to £62,321 annually). (Data are not available on the very top end – such as the 99<sup>th</sup> percentile – but this pattern would likely be even more pronounced there.)

<sup>17</sup> <https://www.bbc.co.uk/news/business-62218706>.

<sup>18</sup> Part-time work is also more prevalent among women, who are themselves more likely to work in the public sector. We explicitly examine differences between men and women in Section 4.5.



Figure 4.6. Distribution of hourly wages, by sector



Source: [Table 13.5a of Annual Survey of Hours and Earnings 2021](#).

Figure 4.6, in summary, shows that the public sector wage distribution is relatively compressed. There are relatively few very low-paying and very high-paying jobs in the public sector, compared with the private sector.

The distributions of hourly wages for men and women separately follow a similar pattern, with the sex-specific public sector wage distribution relatively compressed in both cases. The ratio between public and private sector wages for women is lower than that for men at the lower points of the wage distributions, as illustrated in Figure 4A.1 in the appendix: the extent to which lower-paid women do better in the public sector is less than the extent to which lower-paid men do better in the public sector. From the 40<sup>th</sup> percentile upwards, this situation reverses, and the ratio between public and private sector wages is higher for women than for men.

This exercise still does not provide a complete picture, however. There are important differences between the workforces of the public and private sectors: public sector workers are, on average, more highly educated and older, and are more likely to work part-time. Making direct comparisons between average pay in the private and public sectors thus does not give a full picture of the differences in pay in the two sectors for similar workers.

To address this, in what follows, we continue to focus on *hourly* pay, and control for a range of characteristics: sex, age, experience, education and region. We use the quarterly Labour Force







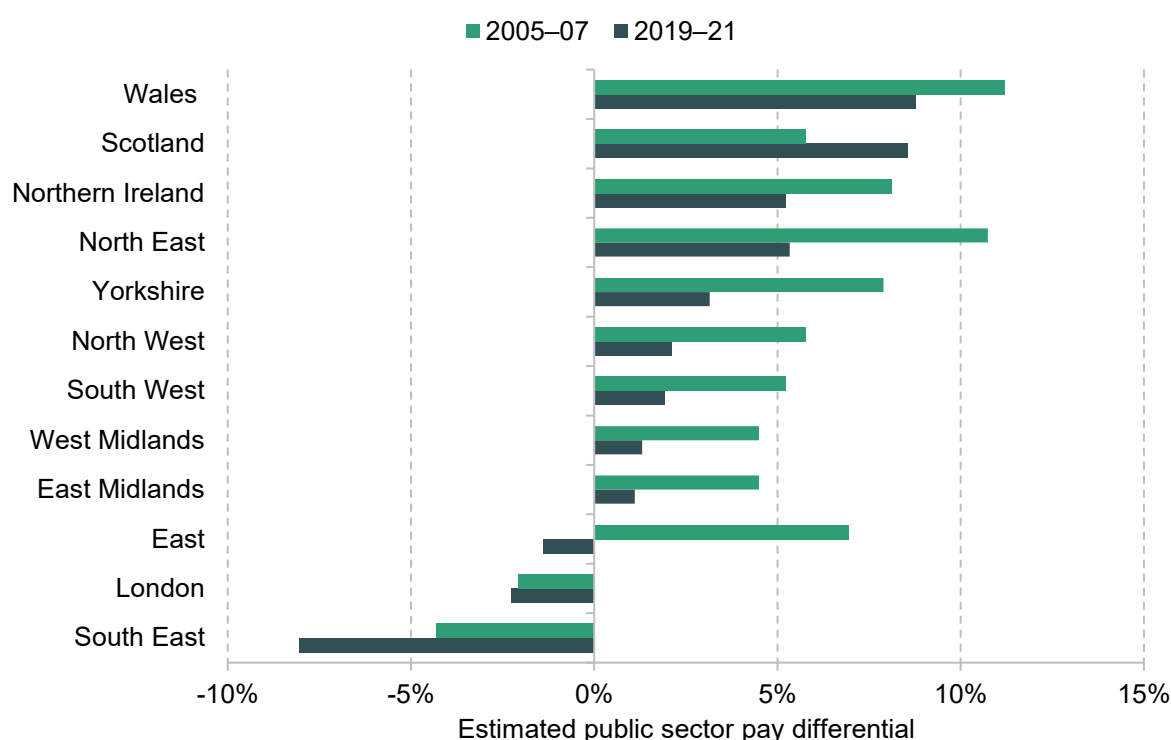


workers. Men are more likely to work in more highly paid occupations such as NHS consultants or judges, where the pay differential is lower (Office for National Statistics, 2019).

### How does the public–private pay differential vary by region?

Figure 4.10 illustrates the average public sector pay differential by region, comparing two periods (2005–07 and 2019–21).<sup>20</sup> The differentials are conditional on workers' characteristics, as previously described.

**Figure 4.10. Public sector pay differential conditional on workers' characteristics, by UK region and nation**



Note: The differential is calculated controlling for age, education, experience and region controls, all interacted with sex, and interactions between education and experience. Figures are for hourly pay and exclude pension contributions.

Source: Authors' calculations using the Labour Force Survey.

As shown, there is considerable variance in the public pay differential across the UK. This is largely driven by private sector pay variation: public sector pay is set on a national level, for the most part, with limited flexibility on a local level. Public sector pay relative to private sector pay was lowest in the South-East, in London and in the East of England over the period 2019–21: in all three regions, the differential was negative (–8.1%, –2.3% and –1.4%, respectively). In

<sup>20</sup> Years are pooled together in order to ensure adequate sample size.

contrast, in Wales, Scotland, Northern Ireland and the North East, public sector pay was considerably higher than private sector pay (with public sector premiums of 8.8%, 8.5%, 5.2% and 5.3%, respectively).

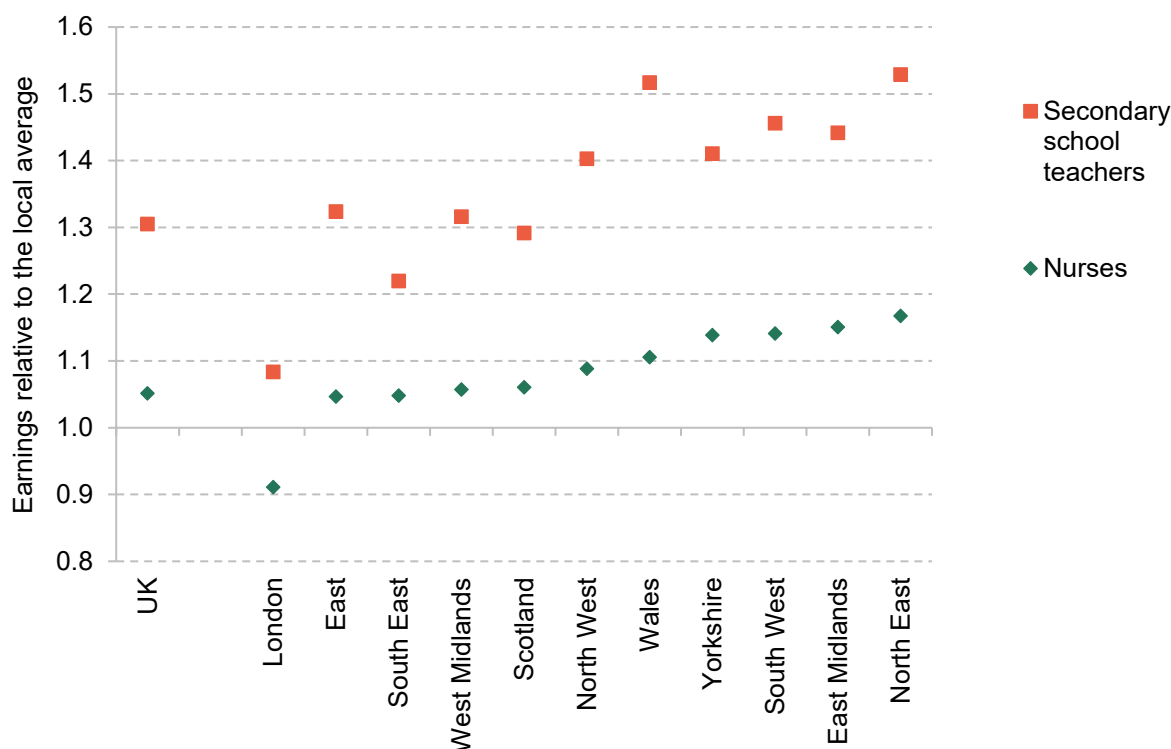
Figure 4.10 also shows the way in which the differential has changed between 2005–07 and 2019–21: in all regions apart from Scotland, the conditional public pay premium has fallen over this period. The fact that relative public sector pay has risen in this period in Scotland could be a result of more generous public sector pay settlements allowed by additional per-person funding the Scottish Government receives via the Barnett formula: the rise in Scotland has been driven by especially strong public sector pay growth.<sup>21</sup> In the East of England, the differential has turned from positive to negative: the expansion of the tech and pharmaceutical sectors around Cambridge, and consequent booming of the private sector in this area, could be one factor behind this change. The fall in the differential, however, has predominantly been driven by relatively weak public sector pay growth in the East.

This regional variation in the public–private pay differential also varies by occupation: in Figure 4.11, we show how average hourly earnings in two large occupations – nursing and secondary school teaching – compare with average earnings by region. On average, nurses in the North East earn 17% more than the average employee in the region, versus just 5% more in the East of England and 9% *less* in London. On average, secondary school teachers in the North East or Wales earn over 50% more than the average employee in their region; a secondary school teacher in the South East earns 22% more than the average. Similar patterns can be seen when a broader set of occupations are considered. There is clearly substantial variation across the country in the level of public sector pay relative to what is on offer in the private sector.

Finally, there is considerable variation in the relative pay of different public sector professions across the country. In Wales, the average secondary school teacher earns 37% more than the average nurse, while secondary school teachers in the South East earn, on average, only 16% more than nurses in the South East. While teachers and nurses both earn least – relative to the local labour market – in London, and most in the North East, the ordering of relative regional earnings by occupation between these two extremes differs. This variation (whether it arises from differences in the characteristics of the public sector workforce by region, or differences in similar workers’ pay by region) may not be deliberate or optimal.

<sup>21</sup> In 2020–21, Scottish Government funding per person was more than 30% higher than the equivalent in England (Phillips, 2021).

Figure 4.11. Average (mean) hourly earnings of workers in selected full-time public sector occupations relative to local average earnings, by region



Note: Full-time workers only. The height of each data point represents the mean wage of each occupation divided by the average full-time wage in the same region.

Source: [Table 15.5a of Annual Survey of Hours and Earnings 2021](#).

### Regional public sector pay deals: a very brief discussion

During the Conservative leadership campaign, Liz Truss proposed the introduction of regional public sector pay boards, claiming that this would eventually save up to £8.8 billion per year (by paying less to public sector employees in areas with lower cost of living), before subsequently dropping the policy.<sup>22</sup> A full appraisal and discussion of this proposal is beyond the scope of this chapter, but there are a number of points worth making.

In principle, a targeted approach to public sector pay is a sensible one – including targeting by geographic region. We already have, for instance, a system of ‘London weighting’ whereby public sector employees in the capital receive higher pay to reflect the higher cost of living. There are potential efficiency gains from more refined targeting. But this does *not* mean that the optimal policy would be to have all regional public–private differentials equal to zero, and there are several key caveats.

<sup>22</sup> See, for example, <https://www.bbc.co.uk/news/62392031>.



First, public sector pay policy should be set with regard to the public services that the government wishes to deliver, with a focus on recruitment and retention. In other words, if the government wishes to introduce a greater amount of regional targeting in pay-setting, it would be sensible to target the regions and places that struggle most to recruit and retain skilled workers. It is far from obvious that the places struggling most to recruit new teachers, for instance, are those with the lowest public–private pay differentials. Relatively deprived rural areas or coastal towns might struggle to attract the requisite number of dentists, despite dentists in those places enjoying high pay relative to the local private sector. Pay is not the only thing that matters.

Second, one of the key attractions for a government seeking to cut taxes without increasing borrowing and/or seeking to reduce the size of the state might be the possibility of budget savings. But introducing more regional pay variation (or, indeed, variation along any other dimension) is much easier to achieve when pay is rising across the board, because pay can just be increased faster in some places than others. Doing it by cutting pay in some places and increasing it in others is considerably more politically difficult.

Finally, a greater degree of regional pay variation or local pay determination might be theoretically attractive but would face considerable challenges in its practical implementation.

### Summary so far

Average annual earnings are now higher in the private sector than in the public sector, but average *hourly* pay in the public sector – where part-time work is more prevalent – is higher. Public sector employees also tend to be more educated and to have more experience in the labour market. The conditional public–private pay differential, which controls for these differences, has fallen steadily from around 3% in 2007–08 and around 7% in 2011–12 to slightly below zero in 2021–22. This differential is now less favourable to the public sector than at any point in the past 30 years. This is true for both men and women, though the estimated differential remains substantially higher for women than for men. The pay differential is also higher for lower-paid public sector workers, and for those living outside of London, the South East and East of England.

## 4.6 How do pensions in the public and private sectors compare?

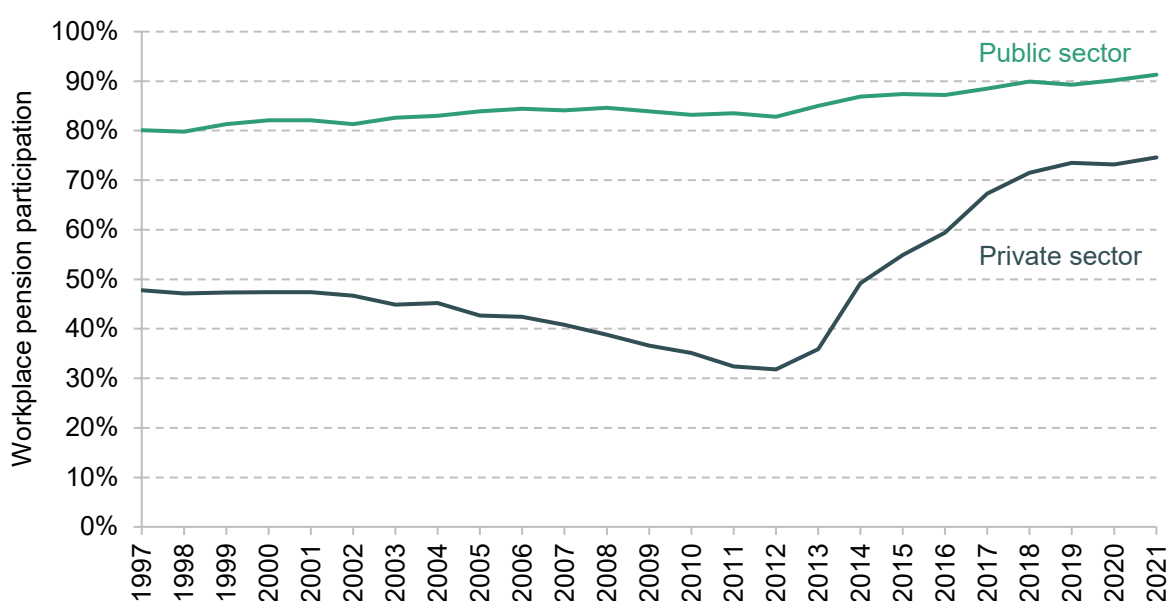
### Why pensions matter

Up to this point, all of our analysis has focused on differences in *pay* between employees in the public and the private sector. However, pay is not the only form of remuneration that employees

receive. In particular, another important (but deferred) form of remuneration is contributions made by employers to pension schemes.<sup>23</sup> Past research has demonstrated that the average value of employer-provided pensions differs substantially between the public and the private sector (Cribb and Emmerson, 2016), and reforms have likely changed this difference over recent years. In this section, we use data from the Annual Survey of Hours and Earnings (ASHE) to examine how accounting for employer pension contributions changes our estimate of the public–private pay differential.

Figure 4.12 plots the share of employees in the public and private sectors who are saving into a workplace pension over time, and provides a first indication of why accounting for employer pension contributions might be important for estimating both the level and the trend of the public pay differential. In every year between 1997 and 2021, public sector employees were much more likely than private sector employees to be enrolled in a workplace pension. Since 2012, the gap in participation has narrowed due to the introduction of automatic enrolment. Whereas in April 2012 only 32% of private sector employees were enrolled in a workplace pension, compared with 83% of public sector employees, by April 2021 pension participation rates were 75% in the private sector and 91% in the public sector.

**Figure 4.12. Workplace pension participation in the public and private sectors, 1997 to 2021**



Note: Data measured in April of each year.

Source: [ONS ASHE pension table P2.1](#).

<sup>23</sup> The level of *employee* pension contributions will also differ between public and private sectors. This will matter for individuals' take-home pay, but not for the total level of remuneration they receive from their employer. However, many employees, particularly in the public sector, have to commit to making employee pension contributions in order to receive a contribution from their employer. We discuss recent trends in employee pension contributions and differences in the structure of remuneration more broadly between the two sectors in Section 4.8.

Differences in pension participation rates are only part of the story: the type of workplace pensions that employees tend to be enrolled in also differs between the sectors. Public sector employees are much more likely to be in (typically much more generous) defined benefit schemes, but these schemes are far less common in the private sector. Table 4.2 shows that more than 80% of public sector employees were enrolled in defined benefit schemes in 2021, compared with just 7% of private sector employees.<sup>24</sup> Notably, while the share of private sector employees with a defined benefit pension has fallen slightly since 2012 (from 8% to 7%, compared with 38% in 1997), the proportion in the public sector has actually increased (from 76% to 82%, and compared with 77% in 1997).<sup>25</sup>

**Table 4.2. Pension participation by type and contribution band for private and public sector employees, 2012 and 2021**

|                                      | 2012           |               | 2021           |               |
|--------------------------------------|----------------|---------------|----------------|---------------|
|                                      | Private sector | Public sector | Private sector | Public sector |
| <b>Participation</b>                 | 32%            | 83%           | 75%            | 91%           |
| Defined benefit                      | 8%             | 76%           | 7%             | 82%           |
| Defined contribution                 | 22%            | 5%            | 66%            | 8%            |
| Unknown                              | 1%             | 2%            | 2%             | 2%            |
| <b>% with employer contributions</b> |                |               |                |               |
| ≥ 4%                                 | 25%            | 82%           | 36%            | 90%           |
| ≥ 10%                                | 12%            | 80%           | 11%            | 86%           |
| ≥ 20%                                | 3%             | 14%           | 2%             | 47%           |
| <b>% with employee contributions</b> |                |               |                |               |
| ≥ 4%                                 | 16%            | 73%           | 41%            | 88%           |
| ≥ 7%                                 | 5%             | 31%           | 8%             | 43%           |

Note: Employer contribution rates as a percentage of pensionable pay, defined as the amount of pay upon which pension contributions are based. Data measured in April of each year. Employers typically use one of three different definitions of pensionable pay: basic pay (basic salary before bonuses, overtime or other additional pay), total pay (pay including bonuses, overtime and other additional pay) or qualifying earnings (total pay between the lower and upper earnings limits for National Insurance, which in 2022–23 are £6,396 and £50,270, respectively).

Source: Authors' calculations using ONS ASHE pension tables [P2.1](#) and [P10.1](#).

<sup>24</sup> We compare 2012 with 2021 in Table 4.2 because 2012 is the last year in ASHE before automatic enrolment started to be rolled out.

<sup>25</sup> 1997 numbers from Cribb and Emmerson (2016).

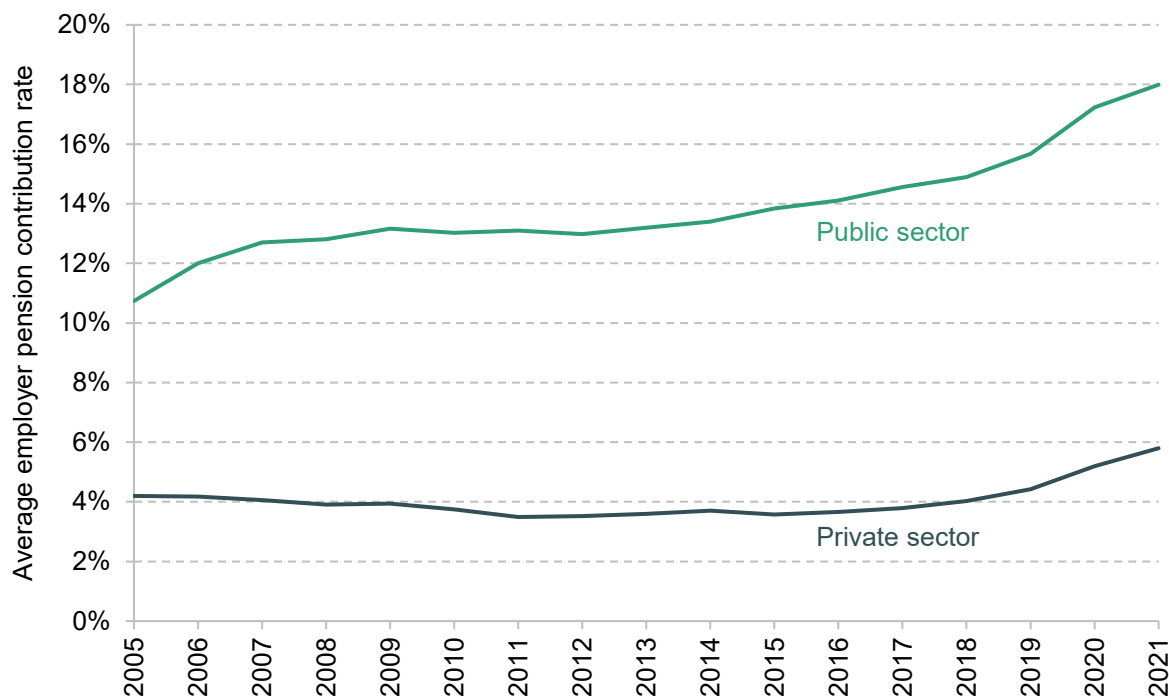
The type of pension scheme employees are enrolled in is heavily linked with the generosity of the pension promises they receive, with defined benefit pensions typically being more generous than defined contribution schemes. Indeed, this is one of the reasons why the private sector has moved away from them. There are different ways to value the generosity of employers' pension promises, as discussed below, one being the value of employer pension contributions reported in ASHE. Table 4.2 shows there are large differences in the share of employees who are receiving valuable employer pension contributions between the two sectors: in 2021, 86% of public sector employees received an employer pension contribution of at least 10% of pay (with the majority of the remainder being those public sector workers who have opted out of the pension scheme), compared with just 11% of private sector employees. In addition, nearly half of public sector employees received an employer pension contribution of at least 20% of pay, but this was the case for only 2% of employees in the private sector. There is also a gap in the share of employees making large employee contributions between the two sectors – while this does not directly enter total remuneration, we return to the implications of this in Section 4.8.

These differences in the proportion of workers in each sector who receive valuable employer pension contributions have actually grown since 2012 despite reforms that might have been expected to narrow the gap. First, automatic enrolment into workplace pensions was rolled out between 2012 and 2018, which hugely boosted workplace pension participation among private sector employees (Cribb and Emmerson, 2021). However, while some private sector employers do offer higher contribution rates than the legal minimum (currently set at 3% of qualifying earnings), very few employees in the private sector receive an employer contribution of anything close to 20% of pay. Second, there were reforms aimed at reducing the value of public sector pensions between 2011 and 2015. In particular, there was a reduction in the indexation of benefits (from RPI to CPI) and an increase in the age at which many public sector workers can receive an unreduced pension (known as the normal pension age) to be aligned with their state pension age for future accrual.

Figure 4.13 shows that in spite of these reforms, the gap between average employer pension contributions (as reported in ASHE) in the public and private sectors has been growing. The average employer contribution rate in the private sector did grow between 2012 and 2021, from just under 4% of pay in 2012 to almost 6% of pay in 2021. However, the average employer contribution rate in the public sector grew by more, from around 13% of pay in 2012 to 18% of pay in 2021 (principally due to reductions in the discount rate used by HM Treasury for estimating the future value of pension payments, as discussed below). Note that in Figure 4.13 and henceforth we impute pension contributions in 2021 for both sectors, because ASHE

microdata with pension saving information for that year have not been released to researchers at the time of this publication.<sup>26</sup>

**Figure 4.13. Average employer pension contribution rate (% of gross pay) across all employees, by sector and year**



Note: Employer pension contribution rate is calculated as weekly employer pension contributions divided by weekly gross pay. Pension contributions for 2021 have been imputed based on the method outlined in footnote 26. Data measured in April of each year.

Source: Authors' calculations using Annual Survey of Hours and Earnings.

### Estimating the value of employer pension contributions

Throughout this section and the analysis that follows, we measure the generosity of employers' pension promises using reported employer pension contributions in ASHE. Specifically, employers are asked how much they contribute to the employee's pension, excluding any lump-sum contributions that cover more than one employee, and excluding any employee contributions made through salary sacrifice. We then divide this figure by the employee's gross pay in the same period to calculate the employer pension contribution rate.

<sup>26</sup> We use the following method to impute employer pension contribution rates for 2021. First, for employees who we observe working for the same employer in 2020 and 2021, we assume their employer contribution rate in 2021 is equal to their employer contribution rate in 2020. For those employees who we observe working for a different employer in 2021 compared with 2020, or who we do not observe in ASHE in 2020, we first regress the employer pension contribution rate on a set of explanatory variables using 2020 data, and then predict 2021 employer pension contribution rates based on the results of this regression. The explanatory variables used for this regression are sex, age (in quadratic), occupation group, region, firm size, an indicator for full-time work, an indicator for temporary contract, log hourly earnings, share of earnings from basic pay, total weekly hours worked, firm type (including whether public or private), and age (in quadratic) interacted with both sex and occupation group.

However, the value of employer contributions (as reported in ASHE) is not the only way to estimate the value of employers' pension promises. Cribb and Emmerson (2016), for example, instead estimate the value of employer-provided pensions as the change in the (discounted) value of future pension income from one year to the next, estimated under simplifying assumptions about the rules of the scheme and the appropriate discount rate. This tends to lead to larger estimates of the value of public sector defined benefit pensions than suggested by looking at employers' reported pension contributions.

This difference is principally a result of the discount rate – that is, the rate at which future income is discounted relative to income received today. All else being equal, using a higher discount rate will lead to a smaller estimated employer pension contribution, and vice versa. Total contributions in public sector schemes are intended to cover the cost of future payments to pensioners in retirement; however, the discount rate used by HM Treasury when calculating the employer contributions needed to cover these costs is higher than the discount rate used in many other places. Currently, the discount rate used by HM Treasury to estimate the future value of pension payments for unfunded schemes (the SCAPE rate), is CPI+2.4%: that is, a nominal discount rate of 4.4%, assuming that on average the 2% CPI inflation target is met.<sup>27</sup> This discount rate was reduced in 2016 and in the 2018 Budget, which led to increases in reported employer contributions in recent years in unfunded public sector pensions (one contributing factor to the increase in average employer contributions in the public sector in Figure 4.13).

There are arguments for using a lower discount rate than the SCAPE rate, and indeed the public sector schemes themselves use lower discount rates for calculating their liabilities. For example, in the NHS Pension Scheme Accounts, the Actuary used a nominal discount rate of 1.25% in 2021 (the yield on high-quality corporate bonds at the time).<sup>28</sup> Using this much lower discount rate of 1.25%, rather than the SCAPE rate of approximately 4.4%, leads to an average current service cost of 62.2% of pay for the NHS Pension Scheme, which is more than double the sum of the average employer contribution rate (20.6%) and the average employee contribution rate (9.8%). This lower discount rate therefore implies the total contribution from the employer and the Treasury is over 50% of pay, rather than the 20.6% contribution rate that the employer (the NHS) pays, and which would be reported in ASHE.

The key question when estimating the value of employer pension promises in defined benefit schemes is what the appropriate discount rate is – whether it should be the SCAPE rate (which

<sup>27</sup> Most public service pension schemes operate on an unfunded basis, with employee and employer pension contributions today (along with additional funding from HM Treasury) used to pay pension benefits to members currently in retirement. Some public service pension schemes, such as the Local Government Pension Scheme, are funded, meaning that pension contributions today are invested in a pension fund, which accumulates returns and is used to pay for future pensions.

<sup>28</sup> See page 15 of NHS Business Services Authority (2021).

approximates the long-run nominal GDP growth rate expected by the OBR), or a much lower rate, such as typical discount rates used by the public sector schemes themselves or by schemes in the private sector. Indeed, it also matters whether the appropriate discount rate should vary by sector – for example, due to differences in how the schemes are ultimately funded. Given that unfunded public sector schemes pay pensions out of future tax revenue, the expected long-run rate of nominal GDP growth may be a sensible discount rate, as this will approximate the growth in the tax base. On the other hand, for funded schemes, a risk-free bond rate, such as the long-run gilt rate, may be a more sensible discount rate. Such a rate may also be more sensible when estimating the ‘value’ to employees. Calculating the value of pension promises using a different discount rate, as in Cribb and Emmerson (2016), is beyond the scope of this chapter, but this is an important caveat to keep in mind when interpreting our results.

## 4.7 How does total remuneration compare in the public and private sectors?

Figure 4.14 shows our estimate of the public–private pay differential in 2021. When looking at pay without bonuses or employer pension contributions, public sector employees earn around 13% more per hour than private sector employees on average. Of course, as discussed above, the composition of workers can differ between the two sectors, which could be one reason for the difference in pay. To account for this, we then control for factors such as age, sex and region (see footnote b in Box 4.2 for a full list) in our analysis, which reduces the estimated public pay differential to 0% (the leftmost yellow bar in Figure 4.14).

Including bonuses in pay reduces the unadjusted differential and the differential after accounting for observed characteristics to 8% and –3%, respectively (as shown by the middle set of bars in Figure 4.14). These figures are broadly comparable to the corresponding differentials for 2021–22 estimated using the LFS in Figure 4.7 (7% and –1%).<sup>29</sup>

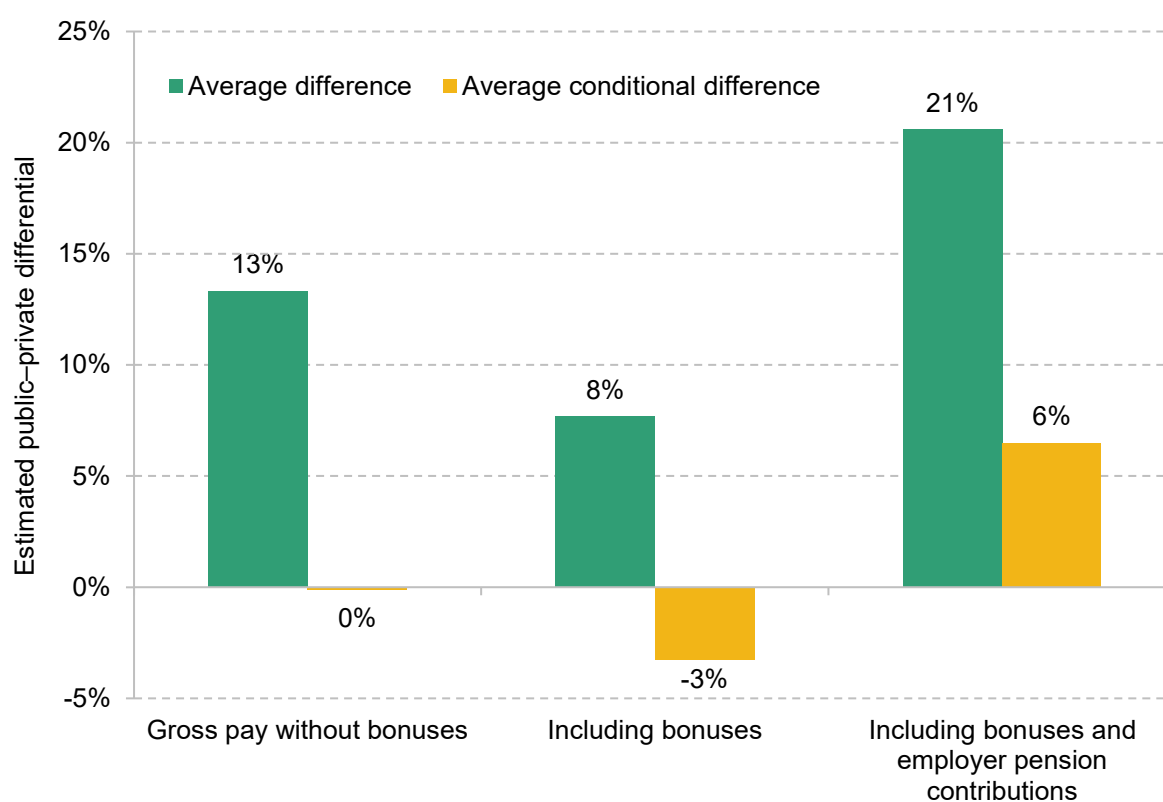
Finally, adding the measure of employer pension contributions reported in ASHE onto pay significantly increases the differentials to 21% (unadjusted) and 6% (after taking account of observed background characteristics), as shown by the rightmost set of bars in Figure 4.14. This highlights the greater generosity of pension schemes in the public sector. It means that, after accounting for bonuses and employer pension contributions, and after accounting for differences

<sup>29</sup> This could be due to a difference in timing (the ASHE figures are for April 2021 while the LFS figures correspond to the whole 2021–22 financial year), differences in controls (e.g. the fact that we cannot adjust for differences in education in ASHE) or other differences between the surveys (such as how we calculate or approximate bonus pay, or the fact that ASHE does not cover Northern Ireland).

in employee characteristics (to the extent that is possible in ASHE), there is an average public sector remuneration differential of around 6%.

It is important to note that including bonuses in our measure of remuneration reduces the estimated public pay differential, while including employer pension contributions significantly increases it. This highlights a key difference in the structure of remuneration between the two sectors, with bonuses on average forming a significant part of remuneration in the private sector, but employer contributions being more important in the public sector. We return to this in Section 4.8.

**Figure 4.14. Average public–private hourly pay and remuneration differentials in 2021**



Note: The differentials are calculated using a regression of hourly pay or remuneration on a public sector dummy. The controls mentioned in footnote b of Box 4.2 are included when calculating the average conditional difference. We then transform the coefficient into a percentage differential based on Halvorsen and Palmquist (1980). Pension contributions have been imputed based on the method outlined in footnote 26.

Source: Authors' calculations using the Annual Survey of Hours and Earnings.



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**Box 4.2. Data used for total remuneration calculations**

Ultimately, we are interested in comparing total remuneration between the public and private sectors: accounting for pay, bonuses and pensions.<sup>a</sup> To examine this, we cannot use the Labour Force Survey, as in Sections 4.4 and 4.5, because the LFS does not contain any information on employer pension contributions. Instead, we use the Annual Survey of Hours and Earnings, which is a survey completed by employers each April with data on around 1% of employees in Great Britain. While ASHE contains comprehensive data on workplace pension contributions, it does not contain information on all of the individual characteristics we used for our analysis using the LFS (such as education and experience). For this reason, we use a different set of controls in this section to adjust for differences in the composition of workers between the two sectors, following Office for National Statistics (2020).<sup>b</sup> In addition, while ASHE does include incentive pay in its measure of gross pay, bonuses paid in April may not be representative of bonuses throughout the year. Therefore, to make bonus data more comparable with data on average weekly earnings (AWE) and from the LFS used above, we instead impute bonuses using AWE at the broad industry level.<sup>c</sup>

<sup>a</sup> This will not capture the entirety of remuneration (it would not capture provision of a company car, for example, or other forms of benefits-in-kind) but data limitations preclude us from a complete analysis.

<sup>b</sup> In particular, we control for sex, age, age-squared, a part-time dummy, job tenure, occupational classification, organisational size, a benefits-in-kind dummy, a temporary contract dummy and region, and we include interactions between sex and age, sex and age-squared, occupation and age, occupation and age-squared, occupation and organisational size, and occupation and region.

<sup>c</sup> Specifically, for the 24 industries in the publicly available AWE industry-level data ([ONS table EARN03](#)), we calculate the share of pay that is from bonuses during the period 2012–21. Then, for each observation in ASHE, we subtract ASHE incentive pay from gross pay, and then multiply this number by the industry-level bonus factor calculated using AWE to obtain an estimate of the average bonus over the full year.

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## How has this total remuneration gap changed over time?

Figure 4.15 shows how the estimated public pay differentials (after taking account of observed differences in the characteristics of the two workforces) have changed over time. All of the estimated public pay differentials have fallen since 2013, although there was a slight, temporary, jump up in 2019. When including bonuses but not employer pension contributions in pay, the estimated differential falls from 8% in 2013 to –3% in 2021 (compared with a fall from 5% to –1% in the LFS).

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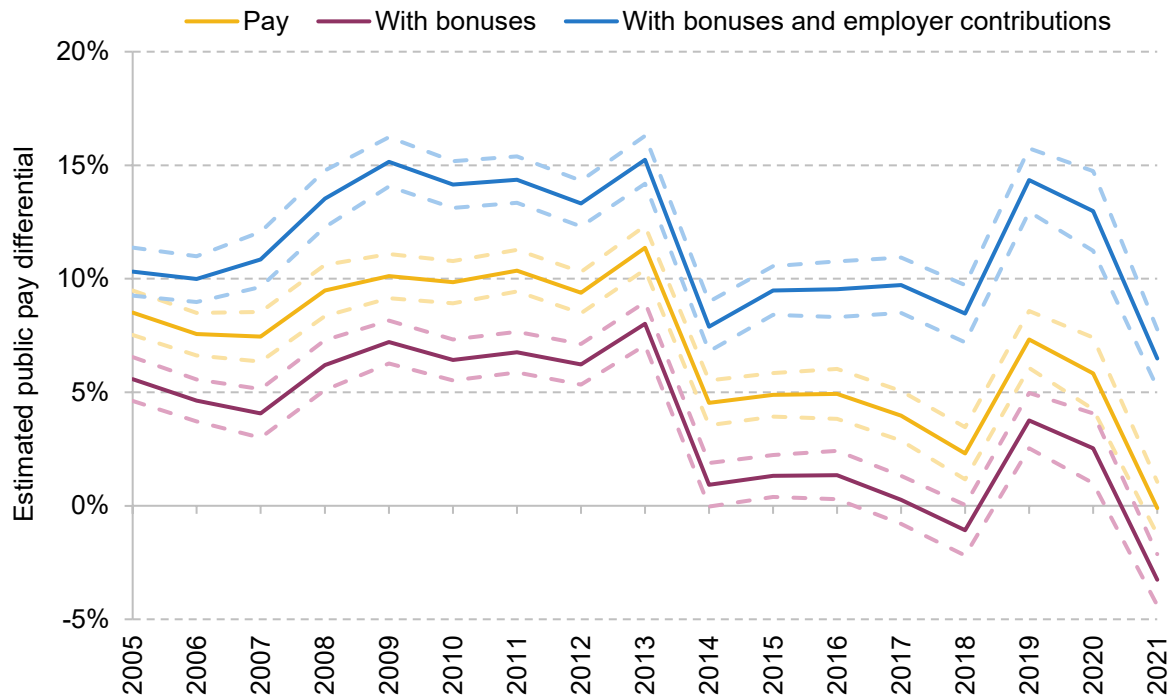
### Box 4.3. Comparison with previous ONS estimates

Figure 4.15 also shows our estimates for the public–private differential in 2019, the final year covered by previous ONS analysis of the public–private remuneration differential (Office for National Statistics, 2020). The ONS’s modelled average public sector earnings differential (after controls) was significantly lower, at 7% in 2019 (versus 14% in our analysis – which is also substantially higher than our estimate for 2021). There are several potential reasons for this discrepancy. First, the ONS analysis takes a different approach to the estimation of bonuses.<sup>a</sup> Second, there are some differences in methodology between the analyses. For example, as far as we are aware, the ONS reports the differential as the estimated coefficient on the public sector dummy variable in its regression.<sup>b</sup> However, as Halvorsen and Palmquist (1980) point out, this will understate the percentage effect of working in the public sector on pay; applying the appropriate transformation to the ONS estimate would reduce the discrepancy between its figures and ours.<sup>c</sup>

- <sup>a</sup> To be precise, the ONS uses the AWE microdata to calculate the share of pay from bonuses for each year, sector and two-digit industry (of which there are 88), and then adjusts pay in ASHE using this factor. Our factor is calculated for each year and broad industry (of which there are 24), and does not vary by sector.
  - <sup>b</sup> The ONS report states: ‘the coefficient to [the public sector dummy] indicates the average earnings difference for working in the public sector’.
  - <sup>c</sup> The ONS kindly provided its code to us for replication purposes. Unfortunately, we were unable to replicate its analysis. This could be due to differences in the raw ASHE data sets used. We also found a possible coding error when (re)constructing the remuneration variables, but were unable to confirm this without access to the underlying data set used by the ONS team in 2019.
- 

The differential in total remuneration including employer pension contributions has also fallen, but by slightly less, from 15% in 2013 to 6% in 2021. The widening gap in average employer pension contributions between the two sectors (with the public sector becoming increasingly more generous relative to the private sector) has therefore somewhat dampened the reduction in the *pay* differential since 2013 (with the public sector becoming steadily less generous relative to the private sector). But overall, the increase in the relative generosity of public sector pensions was enough only to partially offset the reduction in the relative generosity of public sector pay. The gap in overall public–private remuneration therefore narrowed. Importantly, regardless of the measure of remuneration used, Figure 4.15 shows that the estimated differential is at its lowest level over the period since 2005.

Figure 4.15. Average conditional public–private hourly pay and remuneration differentials, 2005–21



Note: The differentials are calculated using a regression of hourly pay or remuneration on a public sector dummy with the controls mentioned in footnote b of Box 4.2. We then transform the coefficient into a percentage differential based on Halvorsen and Palmquist (1980). Pension contributions in 2021 have been imputed based on the method outlined in footnote 26.

Source: Authors' calculations using the Annual Survey of Hours and Earnings.

## 4.8 Longer-term policy issues

The analysis in this chapter of the fiscal policy trade-offs facing the new Chancellor, and of the nature and evolution of the public–private pay differential, raise a number of longer-term policy issues. Here, we discuss two of these.

### The planning horizon for public spending and pay

The crux of the problem for departments is that three years of budgets were fixed in cash terms on the basis of pay assumptions that have turned out to be inaccurate. The fact that pay awards are around 2 percentage points higher than originally budgeted for, combined with pressures from higher energy bills, is causing severe budgetary challenges for public services. This reflects the fact that staff costs account for well over one-third of departments' day-to-day budgets, and so relatively small-sounding changes in pay can have significant impacts. The short-term fiscal choice is whether to provide additional funding to compensate departments for these unexpected costs.

This raises bigger, longer-term questions, though, about the way in which public spending is planned. There is a disconnect between the planning horizons for public sector pay and for departmental budgets: decisions are made at different intervals, despite the fact that the two are inherently linked. Departmental spending limits are typically fixed in cash terms for three or four years at a time at an autumn Budget or Spending Review.<sup>30</sup> Public sector pay decisions are made annually and typically announced over the summer (often for the financial year already in progress).<sup>31</sup> This means that three years of spending limits can be set out under a certain set of pay assumptions, only for the pay awards actually offered to turn out higher or lower. The November 2015 Spending Review, for instance, set out departmental budgets for the 2019–20 financial year, but pay awards for that year were not announced until July 2019.<sup>32</sup>

In ‘normal times’, with low and stable inflation, this is not a major issue. Since the advent of multi-year budgeting in 1998, inflation has rarely deviated much from its 2% target and, even if pay awards have differed from what was originally assumed, the difference has not been large enough to pose significant problems. Challenges arise when, as in the current environment, inflation and pay awards are more volatile. This raises the question of whether the system could be altered to better deal with this challenge.

### One possible solution: align the two planning horizons

One option would be to plan both pay and departmental budgets over the same horizon and at the same frequency. That could mean, for example, setting three years of departmental spending limits and agreeing three-year pay deals with (most) public sector workers concurrently. That would provide more certainty to departments over the staffing costs they are likely to face and prevent budgets and pay awards from falling out of step. Alternatively, the government could return to the previous (pre-1998) system of annual spending rounds and revisit both public sector pay and departmental budgets each year.<sup>33</sup> This, too, would prevent pay awards and budgets from falling out of kilter. But each of these options would come with considerable downsides.

Planning everything on a three- or four-year basis would come at the cost of reduced flexibility over pay and reduced ability to adapt to labour market conditions. Public sector pay is already

<sup>30</sup> This is not always the case: the 2013, 2019 and 2020 spending reviews each covered just a single year, for example.

<sup>31</sup> This is also a simplification: multi-year pay deals are sometimes agreed in the public sector. An example is the four-year pay deal agreed with junior doctors in the English NHS in 2019, which means that those doctors are receiving a 2% pay rise in 2022–23 (lower than what their NHS colleagues who did not have a multi-year pay deal are receiving).

<sup>32</sup> <https://www.gov.uk/government/news/almost-a-million-public-sector-workers-handed-a-second-year-of-inflation-busting-pay-rises>.

<sup>33</sup> Prior to 1998, government spending was planned on an annual basis via a regime of annual Public Expenditure Surveys. This system was abandoned in favour of multi-year budgeting because it was felt that revisiting departmental budgets each year created uncertainty and led to overly short planning horizons. For a recent history and discussion of the issues, see Crawford, Johnson and Zaranko (2018).

less responsive to economic conditions than pay in the private sector – this can be seen in the fact that public sector pay did not fall during either the post-financial crisis or COVID-19 recessions, and the fact that public sector pay is only sluggishly responding to rapid nominal pay growth in the private sector in 2022. Moving to multi-year pay deals across the board would exacerbate this.

On the other hand, returning to an annual budgeting process would come at the cost of reduced medium-term certainty for departments, potentially impeding their ability to plan effectively. Multi-year budgeting is seen as a strength of the UK's system for planning and control of public expenditure (and one that is unusual internationally). Abandoning that would not be costless, and could bring back (or exacerbate) some of the short-termism that multi-year budgeting was introduced to address. An annual spending round could also take up huge amounts of civil servants' time.

### Our preferred option: multi-year budgeting with flexibility

An alternative option would be to largely stick to the current arrangement – multi-year spending settlements and annual pay deals – and instead adapt to shocks through discretionary adjustments to the spending plans. This would, with caveats, be our preferred option.

Under this proposed system, the Treasury would set out several years of departmental (cash) spending limits in advance, at a spending review – as it does now. Alongside this, the Treasury ought to publish the (broad) pay assumptions upon which those plans are based. These spending plans would form the basis of the 'affordability constraint' within which pay review body recommendations have to be made.<sup>34</sup> But if circumstances change – as they have this year – the pay review bodies would have the ability to deviate from those pay assumptions and justify their reasons for doing so. If these deviations are outside of a pre-specified range, the Treasury would then automatically reopen spending review settlements and adjust spending plans – either up or down – or explicitly explain its reasons for not doing so. This would introduce a degree of automaticity into the reassessment of spending plans without placing any obligation on the Treasury.<sup>35</sup>

This proposed system would aim to achieve the best of both worlds. Departments would be provided with the certainty of multi-year budgets; the Treasury would still be able to plan the overall level of public spending alongside decisions over tax and spend, and determine how

<sup>34</sup> This is a desirable feature from a Treasury perspective, as it tends to put a cap on the sorts of pay awards that pay review bodies can make within their remit. This sequencing probably improves the overall degree of public spending control.

<sup>35</sup> One could also imagine a more general version of this set-up, whereby the Treasury would agree that if overall cost pressures (as measured by the GDP deflator) deviated beyond a pre-specified range around the forecast upon which plans were based, settlements would automatically be reopened. This would work symmetrically: unexpectedly low inflation (or deflation) could lead to reductions in departmental budgets under this framework.

much the government can ‘afford’ to increase pay by. In normal times, those plans would be ‘firm and fixed’. But in exceptional circumstances, when pay awards are outside of a pre-specified range, budgets could and would be adjusted as required. This feature need only be used rarely, but its existence would help prevent changes in departmental budgets and pay awards from falling too far out of kilter, and would prevent departments from bearing all of the inflationary risk.

This model would crucially rely on HM Treasury being both able *and willing* to make use of such flexibility, and an understanding that it will do so in exceptional circumstances. COVID-19 was one such circumstance. An inflation shock on the scale of what we are currently experiencing is, in our view, another. Building a larger contingency ‘reserve’ into overall spending plans would help, but building in a reserve on the scale necessary to absorb a shock such as this would not be desirable.

On this occasion, the question of whether or not to open spending plans is entirely at the behest of the new Prime Minister and Chancellor. Looking ahead, in anticipation of future shocks, it would be an improvement to build such a process into the framework for planning and controlling public spending.

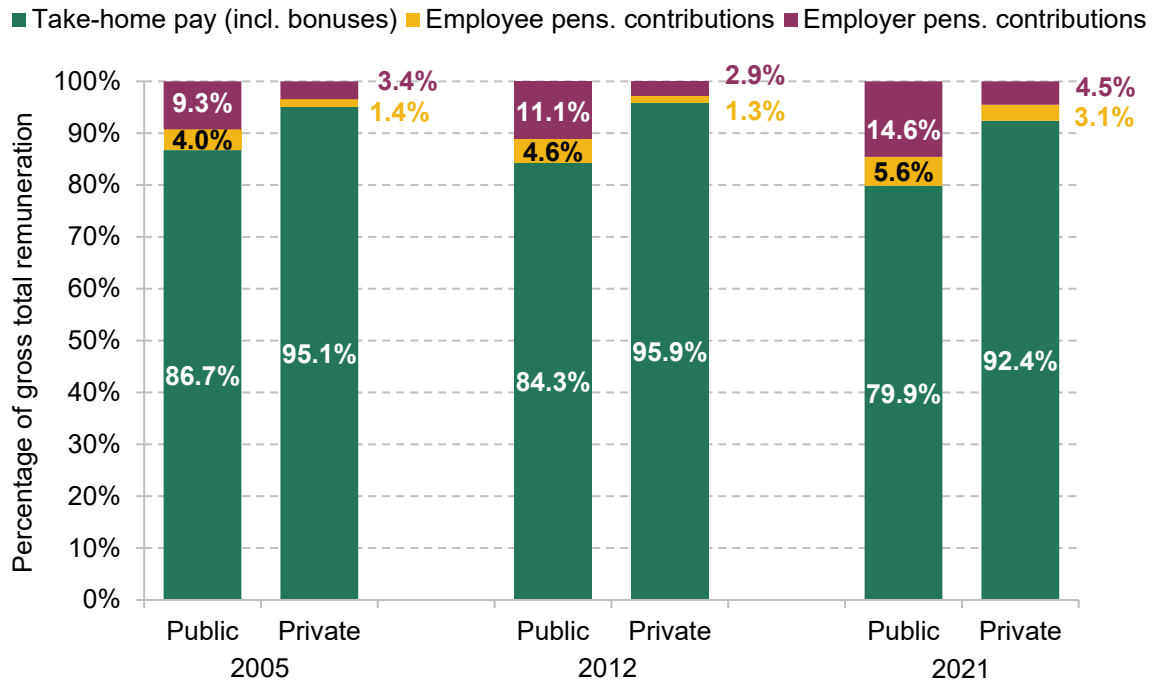
## The structure of public sector remuneration

The analysis in Sections 4.6 and 4.7 shows that there are large differences in the structure of remuneration between the public and private sectors, with public sector employees receiving more compensation in the form of employer pension contributions, and private sector employees receiving more in the form of bonuses. Whether or not this difference in structure is optimal is an open policy question.

Figure 4.16 shows the fraction of hourly remuneration made up by take-home pay (including bonuses) and deferred pay, split into employer and employee contributions.<sup>36</sup> There are two key takeaways. First, a far greater share of overall remuneration is take-home pay in the private sector than in the public sector (92.4% versus 79.9% in 2021). Second, the take-home share has been falling over time in both sectors as pension contributions have risen, but it fell by 2.7 percentage points in the private sector between 2005 and 2021 (from 95.1% to 92.4%) and by 6.9 percentage points in the public sector (from 86.7% to 79.9%).

<sup>36</sup> This is the same measure of total remuneration used in the analysis above – the difference is that gross pay (i.e. the non-employer-pension-contribution element) here is separated into take-home pay and employee pension contributions. For the purposes of this section, we use ‘take-home pay’ to mean pre-tax, non-deferred pay.

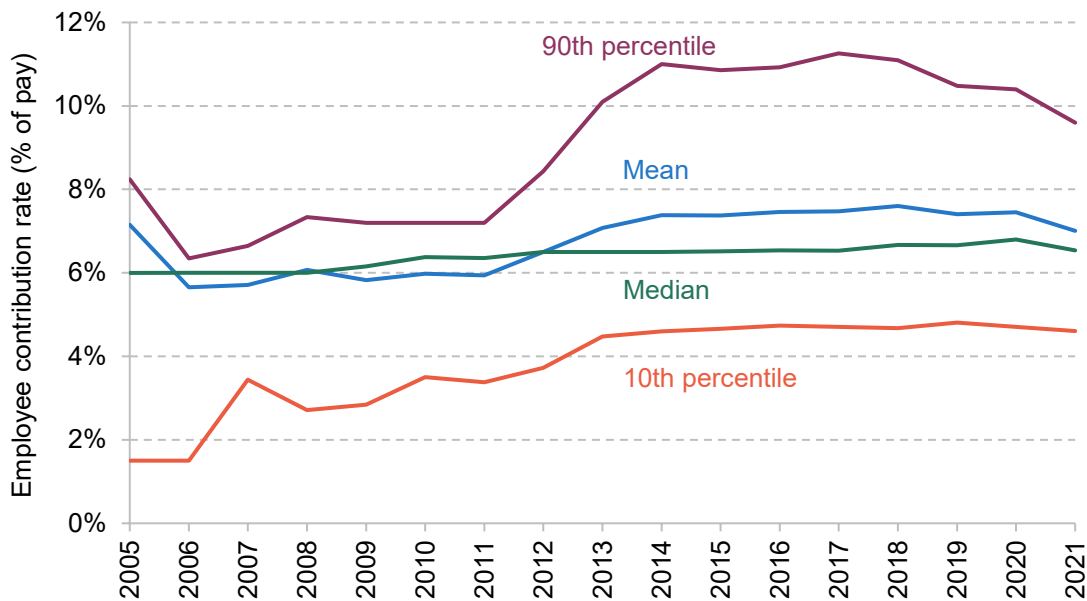
**Figure 4.16. Share of hourly remuneration in the form of take-home and deferred pay, by year and sector**



Note: 'Take-home pay' is used to mean pre-tax, non-deferred pay. Pension contributions for 2021 have been imputed based on the method outlined in footnote 26.

Source: Authors' calculations using the Annual Survey of Hours and Earnings.

**Figure 4.17. Mean, median, 10<sup>th</sup> percentile and 90<sup>th</sup> percentile of employee pension contribution rates among public sector employees participating in a pension, over time**



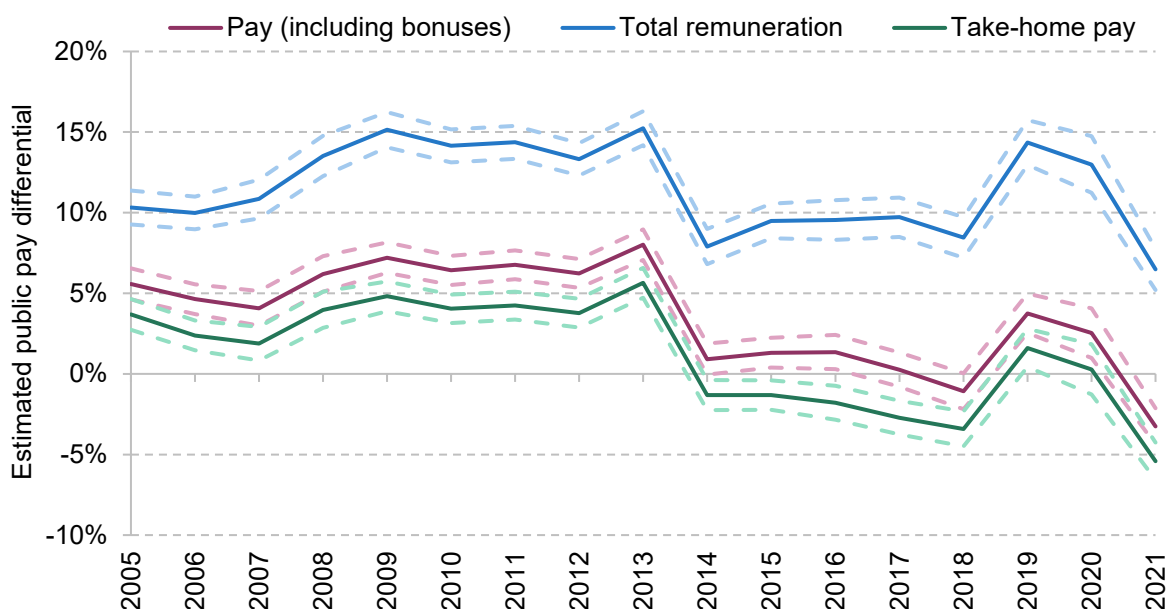
Note: Pension contributions for 2021 have been imputed based on the method outlined in footnote 26.

Source: Authors' calculations using the Annual Survey of Hours and Earnings.

In sum, remuneration in the public sector is considerably more skewed towards deferred pay, in the form of pension contributions, and this has been increasingly true over time. That is in part due to rising employer pension contributions, but *employee* pension contributions have also been rising, as shown in Figure 4.17. The mean employee pension contribution rate (among participants) has increased over time in the public sector, from 5.7% in 2006 to 7.0% in 2021, while it has remained fairly constant at around 4% of pay in the private sector (as shown in Figure 4A.3 in the appendix). Within the public sector, employee pension contribution rates have increased slightly more at the top and the bottom of the distribution than in the middle: the median contribution rate has only increased by 0.5 percentage points of pay between 2006 and 2021, compared with increases of over 3 percentage points at the 10<sup>th</sup> percentile of the distribution (from 1.5% to 4.6%) and at the 90<sup>th</sup> percentile (from 6.3% to 9.6%). Since employee pension contribution rates tend to increase with pay in the public sector, the distribution of take-home pay will be even more compressed in the public sector than the distribution of pay.

All else being equal, higher employee pension contributions mean lower take-home pay. During a cost of living crisis in particular, take-home pay may be a more salient measure of remuneration and more important to employees. Put simply, you cannot heat your home with a pension promise for 30 years hence. For public sector employees (or would-be public sector employees) weighing up their options between the two sectors, take-home pay could well be the key determinant.

**Figure 4.18. Average conditional public–private hourly pay differentials, 2005–21, including take-home pay**



Note: 'Take-home pay' is used to mean pre-tax, non-deferred pay. The differentials are calculated using a regression of hourly pay on a public sector dummy with the controls mentioned in footnote b of Box 4.2. Pension contributions in 2021 have been imputed based on the method outlined in footnote 26.

Source: Authors' calculations using the Annual Survey of Hours and Earnings.



In Figure 4.18, we therefore show how the public–private differential in terms of take-home pay has evolved over time, and how it compares with the pay and total remuneration differentials. While the trends are similar between the three series, the level of the differential for take-home pay is lower than that for pay, reaching –5% in 2021. Clearly, the public sector looks much less attractive if employees are evaluating the two sectors based on take-home pay, rather than on total remuneration.

An additional issue is that with high and rising employee pension contributions, some employees may choose to opt out of their workplace pension – particularly when household budgets are being squeezed. This is of particular concern in the public sector, where defined benefit (DB) schemes are more prevalent. That is because whereas in a defined contribution (DC) scheme employees have the flexibility to choose their own employee contribution rates, in DB schemes there is a set level of employee pension contributions the employee has to pay to enrol in the scheme. It is an in–out, binary decision. As the level of these required public sector employee pension contributions rises, employees have to sacrifice more and more take-home pay in order to receive the generous pension promises from their employer. An increasing number may decide that they are no longer willing – or able – to do so. For many in the public sector, that could mean losing 20% of their total remuneration, due to the loss of the generous employer pension contribution. Private sector employees with more flexible DC schemes, in contrast, could reduce their employee contributions without losing such a large amount of employer contributions.

### Potential for a win–win reform?

There is potentially a strong case, therefore, for rebalancing public sector remuneration away from pensions and towards pay. This could be done without increasing the overall level of remuneration in a cost-neutral fashion that could potentially improve the welfare of public sector workers, who might prefer higher pay today in return for a moderately less generous pension tomorrow, without increasing costs for public sector employers. It might also help prevent a fall in pension scheme membership.

Public sector employees (and their trade unions) might be reluctant to trade away employer pension contributions in return for promises on pay which might be easier for a future government to erode. But one option – or at least a starting point – would be to reduce *employee* pension contributions, alongside a commensurate decrease in pension generosity. That would increase take-home pay for public sector employees with no change to the costs for their employers. There is perhaps a particularly strong case for this at the top end of the public sector pay distribution, where employee contributions are higher and where (as shown in Section 4.5) the public–private pay differential is most unfavourable. Clearly, there would be many details to iron out, and a full discussion lies beyond the scope of this chapter. But revisiting the

appropriate balance between pension and take-home pay ought to be on the government's medium-term policy agenda.

## 4.9 Conclusion

Public sector pay is a complex, contentious and fiscally significant policy area. The government employs more than 5½ million workers at an annual cost of more than £230 billion. What happens to public sector pay is clearly important for those workers and their families. It is also important for the government's overall spending plans and fiscal policy, and its ability to recruit, retain and motivate the skilled individuals required to provide high-quality public services.

This year, the backdrop makes decisions around public sector pay even more difficult than usual. The cost of living is soaring. The economic outlook is increasingly gloomy, with both double-digit inflation and a possible recession looming. The UK is becoming poorer as a nation. Many public sector roles pay considerably less than in the past, and many public sector workers have themselves experienced a real-terms pay cut over the past 12 years or so. As a result, the public–private pay differential is now less favourable to the public sector than at any point in the past 30 years – with this especially true for higher-paid public sector workers and those living in London and the South East. When pensions are accounted for, a public sector pay premium remains – but a much smaller one than in the past.

In short, the prospect of another real-terms pay cut for public sector workers is understandably unappealing, and widespread industrial action remains possible.

The pay offers made to public sector workers so far would indeed mean, for the vast majority, a further real-terms pay cut. While private sector wages are also falling in real terms, it is likely that they will outperform wages in the public sector. That will only worsen existing challenges around recruitment and retention in the public sector.

Amidst a sharp rise in the cost of living, take-home pay is likely to be particularly salient for those in work, as family budgets are squeezed. High and inflexible employee pension contributions reduce take-home pay for public sector employees. The government might consider whether rebalancing public sector remuneration away from pensions and towards pay would represent an improvement – one that could be achieved with no increase in overall staffing costs.

Importantly, the pay awards announced over the summer are above what was budgeted for when departmental spending plans were set out last autumn. Without additional funding to compensate, public services will be forced to make cuts elsewhere to meet the additional costs of a higher-than-expected pay award. That is true this year but, if anything, the challenge is more

acute over the next two, as the costs of higher-than-budgeted pay awards compound over time. Compensating departments would mean spending an additional £5 billion or so this year (2022–23); if pay were frozen in real terms after this year (i.e. pay awards matched inflation), that figure would rise to £10.6 billion by 2024–25. If no such compensation were forthcoming, staying within existing plans for the staff pay bill would require a cut to government headcount of around 110,000 this year, rising to 220,000 by 2024–25.

One major decision for the new Chancellor will be whether to top up existing spending plans, or allow public service quality to (further) deteriorate. This will certainly be the key choice at the spending review promised later this year, and could be one of the defining fiscal choices for the remainder of this parliament.

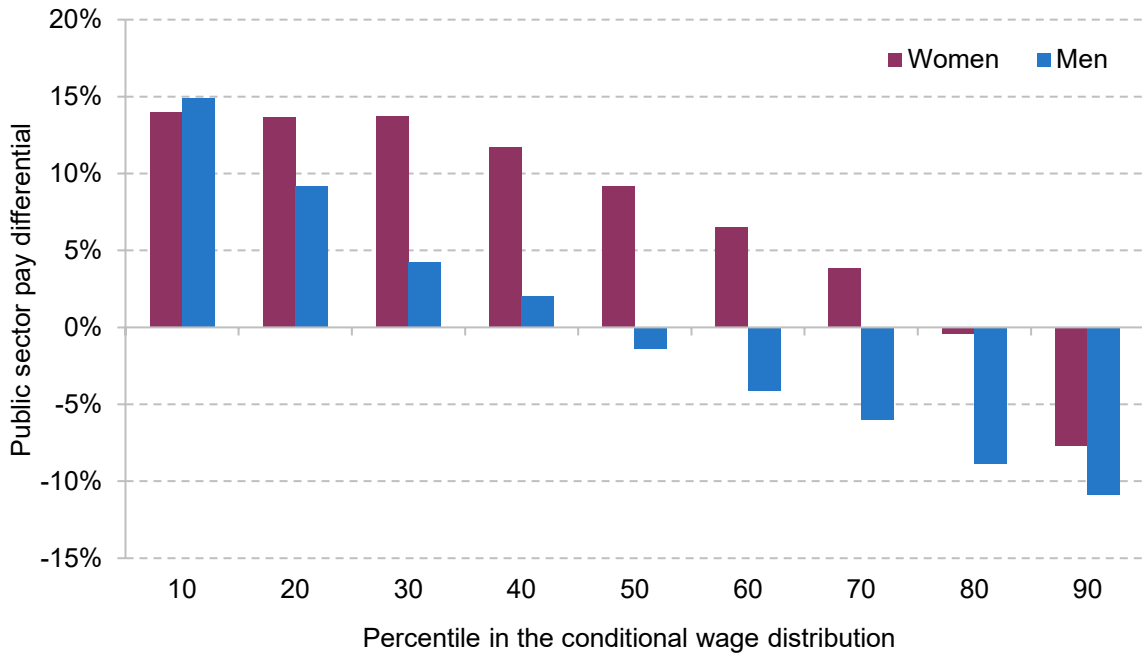
## Appendix

Figure 4A.1. Ratio between public sector and private sector hourly wages, by sex



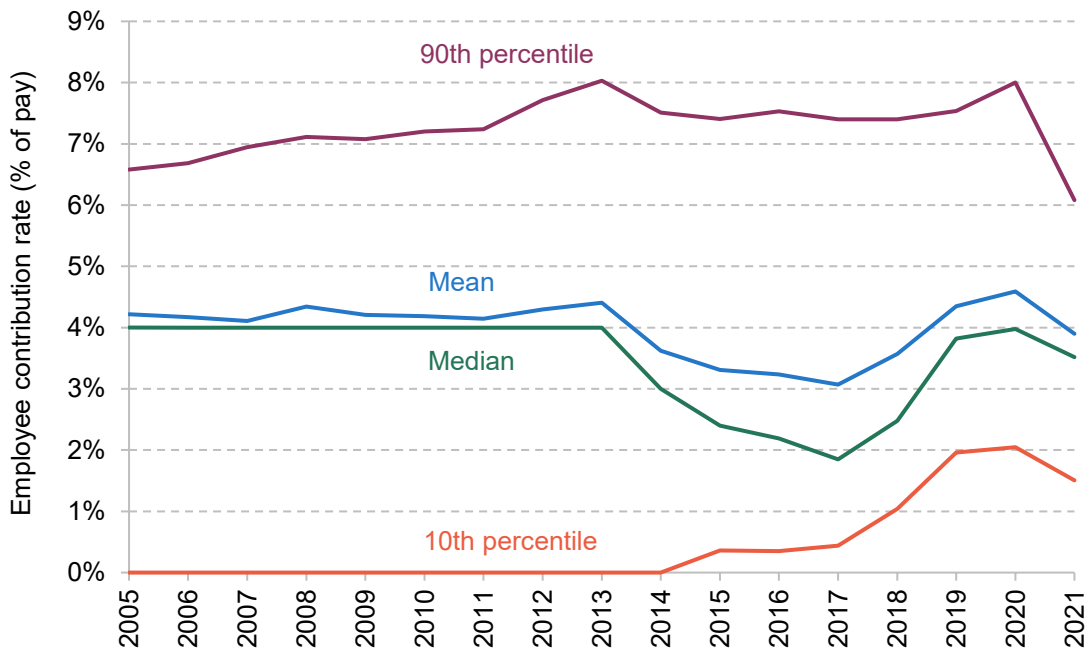
Source: [Table 13.5a of Annual Survey of Hours and Earnings 2021](#).

**Figure 4A.2. Estimated public–private wage differential by percentile in the conditional wage distribution, 2015–16**



Source: Authors' calculations using the quarterly Labour Force Survey, 2015Q2 to 2016Q1.

**Figure 4A.3. Mean, median, 10<sup>th</sup> percentile and 90<sup>th</sup> percentile of employee pension contribution rates among private sector employees participating in a pension, over time**



Note: Pension contributions for 2021 have been imputed based on the method outlined in footnote 26.

Source: Authors' calculations using the Annual Survey of Hours and Earnings.

## References

- Bank of England, 2022. Monetary Policy Report – August 2022. <https://www.bankofengland.co.uk/monetary-policy-report/2022/august-2022>.
- Crawford, R., Johnson, P. and Zaranko, B., 2018. The planning and control of UK public expenditure, 1993–2015. Institute for Fiscal Studies (IFS), Report R147, <https://ifs.org.uk/publications/planning-and-control-uk-public-expenditure-1993-2015>.
- Cribb, J. and Emmerson, C., 2016. Workplace pensions and remuneration in the public and private sectors in the UK. *National Institute Economic Review*, 237, R30–7, <https://doi.org/10.1177/002795011623700114>.
- Cribb, J. and Emmerson, C., 2021. What can we learn about automatic enrollment into pensions from small employers?. *National Tax Journal*, 74(2), 377–404, <https://doi.org/10.1086/714113>.
- DDRB, 2022. Review Body on Doctors’ and Dentists’ Remuneration: Fiftieth Report 2022. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1092259/DDRB\\_2022\\_report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1092259/DDRB_2022_report.pdf).
- Emmerson, C. and Stockton, I., 2022. Reversing NICs and corporation tax rises would leave debt on an unsustainable path. Institute for Fiscal Studies (IFS), Report R217, <https://ifs.org.uk/publications/reversing-nics-and-corporation-tax-rises-would-leave-debt-unsustainable-path>.
- Halvorsen, R. and Palmquist, R., 1980. The interpretation of dummy variables in semilogarithmic equations. *American Economic Review*, 70(3), 474–5, <http://www.jstor.org/stable/1805237>.
- HM Treasury, 2021. Autumn Budget and Spending Review 2021. <https://www.gov.uk/government/publications/autumn-budget-and-spending-review-2021-documents>.
- NHS Business Services Authority, 2021. NHS Pension Scheme Annual Report and Accounts 2020-21. [https://www.nhsbsa.nhs.uk/sites/default/files/2021-07/CCS001\\_CCS0521624740-001\\_NHS%20Pension%20Accounts%202020-21\\_Web%20Accessible.pdf](https://www.nhsbsa.nhs.uk/sites/default/files/2021-07/CCS001_CCS0521624740-001_NHS%20Pension%20Accounts%202020-21_Web%20Accessible.pdf).
- NHSPRB, 2022. NHS Pay Review Body: Thirty-Fifth Report 2022. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1092270/NHSPRB\\_2022\\_Accessible.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1092270/NHSPRB_2022_Accessible.pdf).
- Office for National Statistics, 2019. Who works in the public sector?. <https://www.ons.gov.uk/economy/governmentpublicsectorandtaxes/publicspending/articles/whoworksinthepublicsector/2019-06-04>.

Office for National Statistics, 2020. Public and private sector earnings: 2019.

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/earningsandworkinghours/articles/publicandprivatesectorearnings/2019>.

Office for National Statistics, 2022. Average weekly earnings in Great Britain: August 2022.

<https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/averageweeklyearningsingreatbritain/august2022>.

Office of Manpower Economics, 2021. OME Stewardship Report 2020 to 2021.

<https://www.gov.uk/government/publications/ome-stewardship-report-2020-to-2021>.

Ogden, K., Phillips, D. and Siôn, C., 2021. What's happened and what's next for councils?. In C. Emmerson, P. Johnson and B. Zaranko (eds), *The IFS Green Budget: October 2021*, <https://ifs.org.uk/books/whats-happened-and-whats-next-councils>.

Phillips, D., 2021. How and why has the Scottish Government's funding changed in recent years? Institute for Fiscal Studies (IFS), Report BN321, <https://ifs.org.uk/publications/how-and-why-has-scottish-governments-funding-changed-recent-years>.

PSPRB, 2022. Prison Service Pay Review Body: Twenty First Report on England and Wales 2022.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/109225/3/PSPRB\\_2022\\_E\\_W\\_report.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/109225/3/PSPRB_2022_E_W_report.pdf).

Sibieta, L., 2022a. School spending and costs: the coming crunch. Institute for Fiscal Studies (IFS), Report BN347, <https://ifs.org.uk/publications/school-spending-and-costs-coming-crunch>.

Sibieta, L., 2022b. The even longer squeeze on teacher pay. Institute for Fiscal Studies (IFS), Comment, <https://ifs.org.uk/articles/even-longer-squeeze-teacher-pay>.

Warner, M. and Zaranko, B., 2021. Pressures on the NHS. In C. Emmerson, P. Johnson and B. Zaranko (eds), *The IFS Green Budget: October 2021*, <https://ifs.org.uk/books/pressures-nhs>.

Zaranko, B., 2022a. What should public sector pay policy be trying to achieve? Institute for Fiscal Studies (IFS), Comment, <https://ifs.org.uk/articles/what-should-public-sector-pay-policy-be-trying-achieve>.

Zaranko, B., 2022b. The inflation squeeze on public services. Institute for Fiscal Studies (IFS), Comment, <https://ifs.org.uk/articles/inflation-squeeze-public-services>.

## Data

Office for National Statistics. (2022). *Annual Survey of Hours and Earnings, 1997-2021: Secure Access*. [data collection]. *20th Edition*. UK Data Service. SN: 6689, DOI: 10.5255/UKDA-SN-6689-19

Office for National Statistics. Social Survey Division, Northern Ireland Statistics and Research Agency. Central Survey Unit. (2022). *Quarterly Labour Force Survey, 1993-2022*. Retrieved from <https://beta.ukdataservice.ac.uk/datacatalogue/series/series?id=2000026>