City Research Online

City St George's, University of London

Citation: Forth, J., Bryson, A. & Stokes, L. (2016). Are firms paying more for performance?. International Journal of Manpower, 37(2), pp. 323-343. doi: 10.1108/ijm-01-2015-0006

This is the accepted version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

Permanent repository link: https://openaccess.city.ac.uk/id/eprint/20906/

Link to published version: https://doi.org/10.1108/ijm-01-2015-0006

Copyright and Reuse: Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to City Research Online policy.

City Research Online: http://openaccess.city.ac.uk/ publications@citystgeorges.ac.uk

Are Firms Paying More For Performance?

John Forth (NIESR)[1]

Alex Bryson (UCL and NIESR)

Lucy Stokes (NIESR)

April 2016

Purpose

We use firm-level data to investigate changes in the economic importance of performance-related-pay (PRP) in Britain through the 2000s.

Design/methodology/approach

We utilise nationally-representative, monthly data on the total wage bill and employment of around 8,500 firms. Using these data, we decompose the share of the total economy-wide wage bill accounted for by bonuses into the shares of employment in the PRP and non-PRP sectors, the ratio of base pay between the two sectors, and the gearing of bonus payments to base pay within the PRP sector.

Findings

The growth in the economic importance of bonuses in Britain in the mid-2000s – and subsequent fluctuations since the onset of recession in 2008 – can be almost entirely explained by changes in the gearing of bonus to base pay within the PRP sector. There has been no substantial change in the percentage of employment accounted for by PRP firms; if anything it has fallen over time. Furthermore, movements in the gearing of bonuses to base pay in the economy are heavily influenced by changes in Finance: a sector which accounts for a large proportion of all bonus payments in Britain.

Research implications

The paper demonstrates the importance of understanding further how firms decide the size of bonus payments in a given period.

Originality/value

Ours is the first paper to present monthly firm-level data for the Britain on the incidence and size of bonus payments in the 2000s.

Key words: performance pay; bonuses; recession; business cycle; finance
JEL Classification: J33

[1] Corresponding Author: j.forth@niesr.ac.uk

Acknowledgements and Disclaimer

This work is funded by the Economic and Social Research Council, Grant Reference ES/I035846/1. It includes analyses based on data from the Monthly Wages and Salaries Survey, produced by the Office for National Statistics (ONS) and supplied by the Secure Data Service at the UK Data Archive. The data are Crown Copyright and reproduced with the permission of the controller of HMSO and Queen's Printer for Scotland. The use of the data in this work does not imply the endorsement of ONS or the UK Data Service at the UK Data Archive in relation to the interpretation or analysis of the data. This work uses research datasets which may not exactly reproduce National Statistics aggregates. We thank participants at the Eversheds Labour Relations Conference in 2012, the "New Research in Performance-related Pay" 2013 Conference at the University of Aberdeen, the 2013 WPEG Conference, the 2014 "Workshop on Firm-Level Analysis of Labour Issues" in Louvain, and seminars at NIESR and King's College, London for useful comments. None of these organisations bears any responsibility for the authors' analysis and interpretations of the data.

1. Introduction

Labour economists ascribe great importance to performance-related pay (PRP) because, compared to paying fixed time-rate wages, it provides opportunities to increase labour productivity by inducing additional effort and attracting high ability workers (Lazear, 1986; Prendergast, 1999). There is abundant empirical evidence in support of these propositions in settings as diverse as windshield repairs (Lazear, 2000), strawberry picking (Bandiera *et al.*, 2007), and tree planting (Shearer, 2004). Given its economic benefits, one might expect the incidence of PRP to be high in market-oriented economies. Yet the research literature has provided ample evidence of the hidden costs of PRP (Prendergast, 1999: 21-33; Frick et al, 2015), and early studies found PRP was less pervasive than might have been anticipated if it was optimal for most firms.

It is perhaps for this reason that Lemieux *et al.*'s (2009) seminal paper (LMP hereafter) attracted so much attention. Using the Panel Study of Income Dynamics (PSID) they found the incidence of PRP jobs in the United States increased from 38 per cent in the late 1970s to around 45 per cent in the 1990s. More telling still, they speculated that secular changes in technology might lie behind the growth of PRP. The first of these changes is skills-biased technical change (SBTC) which has increased demand for skilled labour in industrialised economies, inducing employers to attract the most able workers by linking their rewards to performance. The second potential technical reason for the growth of PRP has been the advances in information and communication technologies which have reduced the costs of collecting and processing information about worker performance (op. cit., 3). Since these trends in SBTC and monitoring costs are likely to be pervasive across advanced market-oriented economies, albeit to varying degrees, it is conceivable that they may have led to further growth in the use of PRP in the US in recent years, and to growth in other countries.

However, recent studies inspired by LMP have raised important questions about current trends, at least for the United States. First, using establishment data from the Bureau of Labor Statistics' Employer Costs for Employee Compensation (ECEC) series (which derives from the National Compensation Survey), Gittleman and Pierce (2013a) show the proportion of jobs with performance pay rose in the 1990s, only to fall in the 2000s such that, by 2013, it had *declined* by about one-fifth in the period since LMP's study period. They test various possible reasons for the decline, but none have much explanatory power. However, they do show that, although the decline is apparent throughout the wage distribution and within industry and occupation, it is concentrated among lower earners. Second, a series of papers have begun to question whether there is positive selection into PRP on ability. Using the PSID used by LMP, Heywood and Parent (2012) show that, among men, the tendency for observationally more able employees to enter PRP jobs is only apparent for whites, not

blacks. Indeed they say "if anything [we find] evidence that high-ability blacks sort out of performance pay" (op. cit.: 281). In a second paper using the National Longitudinal Survey of Youth (NLSY), Heywood and Parent (2013) find skilled fathers select into performance pay jobs, whereas skilled mothers select out of performance jobs. These findings are not consistent with the standard assumptions regarding workers sorting into performance pay jobs on ability, and suggest that any increase in PRP incidence driven by SBTC may not be as straightforward as LMP imply.

These studies raise questions about recent trends in PRP in other market-oriented economies. Cross-sectional comparative studies find low PRP incidence rates of around 10-15 per cent in many European countries, compared to around 40 per cent in the United States. Only Scandinavian countries seem to approach the PRP incidence levels of the United States (Bryson *et al.*, 2013). But have other countries experienced any recent growth in PRP? This paper focuses on developments in Britain, a country in the lower half of international rankings in terms of the percentage of employees who said they were in receipt of PRP in the mid-2000s (Bryson *et al.*, 2013). Evidence from the periodic Workplace Employment Relations Survey (WERS) series has indicated that the percentage of all workplaces in Britain using PRP schemes increased between 1984 and 2004, though the increase was far from uniform across different types of PRP (Pendleton *et al.*, 2009). However, the latest WERS, conducted in 2011, suggests that PRP has reached a plateau and that, in the case of employee share plans, usage has actually fallen (Van Wanrooy *et al.*, 2013). The emerging picture for Britain thus has some resonance with that portrayed by Gittleman and Pierce (2013a) for the United States. There is little else by way of evidence on trends in PRP in Britain however. One exception is the research undertaken by Bell and Van Reenen (2010, 2013) which indicates that annual bonuses have played an important role in the growth of wage dispersion at the top of the earnings distribution, especially in Finance, a sector which is more significant for the UK economy than it is for the US.

We contribute to this literature by mapping the incidence of PRP using firm-level data that have never before been used in this literature. These data are the Monthly Wages and Salaries Survey (MWSS) which are the basis for the Office for National Statistics' Annual Earnings Index. The MWSS is a monthly survey which employers are required to complete under statute. They are therefore high quality, high frequency data.[i] The survey is large (circa 8,500 observations per month) and is a census of all large firms and a rotating panel of smaller firms. We use the data to test hypotheses regarding secular and cyclical trends in PRP.

We have four main findings. First, we show that there was some growth in the share of total pay accounted for by bonuses in the mid-2000s. Second, we show that this rise – and

subsequent fluctuations – can be almost entirely explained by changes in the gearing (or multiplier) that is applied to base pay in the PRP sector. In contrast, there has been no increase in the percentage of employment accounted for by PRP firms; if anything it has fallen over the past decade. Third, bonuses are shown to be more cyclical than base pay, such that the overall share of wages paid out in bonuses fell during the recent recession. Fourth, movements in the gearing of bonuses to base pay in the economy at large are heavily influenced by changes in the Finance industry: a sector which accounts for a large proportion of all bonus payments in the British economy. One implication is that further research is needed on how firms – particularly in Finance but also elsewhere in the economy – decide upon the appropriate size of bonus payments for their workers from one period to the next.

The remainder of the paper is as follows. Section Two briefly reviews the literature and outlines our key hypotheses. Section Three introduces our data and presents our empirical strategy for describing and analysing the data. Section Four presents our results. Section Five concludes.

2. Literature and Hypotheses on the Changing Incidence of PRP

Both the incidence of PRP and the size of performance-related payments to employees are contested issues in the literature. There is good economic evidence that PRP elicits greater worker effort and can improve labour productivity (see Bryson *et al.*, 2013, for a review). Thus, one might anticipate a high incidence of PRP in the economy, at least in the market-oriented sector seeking to maximise profits. Consequently, evidence suggesting that its incidence is patchy and that, even when it is present, it forms a relatively small percentage of total pay, are met with some surprise and even scepticism.

PRP is not necessarily optimal in some settings, however. For instance, where it is difficult to link the effort or performance of particular workers directly to output, it may not make sense to resort to PRP, and employers may instead prefer to incentivise employees using other instruments such as career progression via promotion (Prendergast, 1999), as is often the case in professions and parts of the public sector.[ii] Equally, where intrinsic motivation is strong, an emphasis on monetary rewards can prove counterproductive (see Benabou and Tirole, 2003). Moreover, workers may not wish to share the employer's risk associated with firm or individual performance, preferring instead a standard base wage which does not vary with performance or, if it does vary, for the sensitivity of pay to performance to be relatively low (see Dohmen and Falk, 2011).[iii] Employers, recognising the need to trade off efficiency against insurance, may choose to set the elasticity of pay to performance well below that which might be optimal for profit maximisation. Finally, employers and workers may be wary of the potentially negative consequences of increased wage inequality arising from PRP (see Levine, 1991).

International evidence from employee-level data for the mid-2000s indicates that the percentage of employees in receipt of PRP varies markedly across countries from around 10-15 per cent in most European countries, rising to around 40 per cent in Scandinavia and the United States (Bryson *et al.*, 2013). No such comparative evidence exists with respect to the size of performance payments or their share of total wages.

It is against this backdrop that we test the following hypotheses.

H1: There has been a secular rise in the use of PRP in Britain

There are several reasons why one might expect PRP to have grown over time. These relate to falling worker bargaining power, greater potential benefits of PRP to firms, changes in tasks and production technology, and shifts in the composition of occupations.

As noted earlier, the declining costs of the technologies required to monitor output may encourage increased use of PRP (McGovern et al, 2007) and skills-biased technological change (SBTC) increases the demand for highly productive workers who may be attracted by PRP (LMP, 2009: 3). Bryson *et al.* (2013) show the likelihood of receiving PRP rises with employee job autonomy in both the United States and Europe and that, in Europe, it also rises among those performing more complex tasks. If SBTC has also resulted in a task-based polarisation of jobs in the economy, the growth of highly skilled autonomous working at the top end of the occupational distribution may also be conducive to the use of PRP.[iv] For all these reasons one might expect to see growth in the use of PRP over time and, perhaps, a bigger gearing of pay to performance where PRP is used.

A variant of this hypothesis is that production processes are developing in such a way as to limit the use of traditional individual PRP, such as piece rates, with employers substituting them instead with group-based incentives that complement team-oriented working that characterises an increasing proportion of work settings. Freeman and Kleiner (2005) note the demise of individual PRP in American manufacturing, while Dube and Freeman (2010) and Kruse *et al.* (2010) point to substantial growth in financial participation schemes and group-based PRP. However, both group-based PRP *and* individual PRP have been rising in Europe (Bryson *et al.*, 2013), perhaps because merit pay - based on subjective assessments of employee performance by managers and supervisors - has been substituting for other forms of individual PRP.

LMP (2009) also link the rise of PRP in the United States to the demise of trade unionism which, they suggest, has acted as a constraint on the use of PRP. Using panel data from the National Longitudinal Survey of Youth (NLSY) for the United States, O'Halloran (2013) finds that, while there is a negative correlation between unions and most forms of PRP, the

opposite is true for piece-rates. Britain has seen a continued decline in unionisation over the last decade (Bryson and Forth, 2011; Van Wanrooy *et al.*, 2013). If one accepts the contention that unions act as a constraint on the use of PRP, then one might anticipate their waning influence to translate into a secular rise in the use of PRP in Britain. Evidence through to 2004 indicates a rise in the workplace incidence of PRP in Britain in the previous quarter-century, although there is no clear evidence that this rise is linked to union decline (Pendleton *et al.*, 2009).

In spite of there being a variety of potential influences on the growth of PRP, it is also acknowledged in the literature that PRP schemes do not always work as intended. The dangers inherent in PRP include sabotage, ratchet effects (gaming), and the exclusive focus on incentivised targets to exclusion of other desirable outcomes. These problems may lead firms to abandon PRP and, indeed, there is evidence that firms do switch out of, as well as into, performance-related pay (e.g. Belfield and Marsden, 2003). It is thus not inevitable that the incidence of PRP will rise over time. As noted earlier, Gittleman and Pierce (2013a) used the Bureau of Labor Statistics' Employee Costs for Employee Compensation (ECEC) data set to show that the percentage of jobs with PRP in the United States fell by 10 percentage points in the 2000s such that their incidence is now lower than it was in the period covered by LMP's (2009) PSID study. This is the first evidence that the continued growth in PRP anticipated by some analysts has not materialised.

H2: PRP is pro-cyclical

Some maintain that PRP schemes are sometimes little more than a pay relabeling exercise. For example, firms respond to tax incentives when setting up profit-related pay and share ownership plans because they are treated as tax-efficient payment methods. This observation may help explain international differences in the incidence of financial participation schemes (Bryson *et al.*, 2013) and the otherwise hard-to-explain changes in the use of share ownership plans and profit-related pay in Britain (Pendleton *et al.*, 2009). Nevertheless, in most instances it seems reasonable to assume that PRP schemes are genuine efforts by employers to link their employees' pay to their own performance or that of the firm, whether as an incentive, or as a means of sharing the risks (or profits) arising from fluctuations in market conditions. Blanchflower et al (1996) provide evidence that wages change in response to sectoral profitability. Therefore we should expect pro-cyclical movement in payments for performance because, on average, one expects individual firms' fortunes to rise and fall with those of the rest of the economy. Fixed base wages may also adjust to macro-economic conditions, but we would expect them to be much less responsive to economic conditions than PRP, and any adjustment we do observe is likely to be less pronounced than the adjustment in performance payments.

Among employees in general there is evidence for Britain that real earnings have become more sensitive to unemployment since the early 2000s (Gregg and Machin, 2012). Although the authors do not investigate how much of this sensitivity is associated with the incidence and size of PRP, the magnitude of the change is such that much of it is likely due to the increased sensitivity of base pay.[v] Empirical support for sensitivity of pay-to-performance is found in the executive pay literature where most or all of the adjustment in compensation comes through performance bonuses and related options. However, Bell and Van Reenen (2011) find non-executive pay is much less sensitive to firm performance. They argue this is because "only senior executives have a large enough share of pay in bonuses to generate a sizeable overall effect on pay" (p. 1) while base pay remains relatively insensitive to firm performance.

Whether firms' propensity to use PRP schemes is affected by the business cycle is less certain, a priori. It will depend, in part, on the bargaining power of workers and firms. Employers may be more eager to share income risks with workers in economic downturns through the promotion of PRP, whereas workers may prefer PRP in economic upswings when there are larger rents to share. Industrial relations scholars point to the inertia in payment systems and the transaction costs associated with changing schemes, considerations which imply movement in and out of PRP is likely to be less responsive to the business cycle than we might otherwise anticipate. Using a very broad definition of performance pay, Gittleman and Pierce (2013b) suggest that the steep decline in the number of hours compensated with PRP in the United States since the early 2000s is most likely due to "cyclical factors related to the Great Recession".

H3: Explanations for trends in performance-related pay in Britain will be dominated by what happens in the Finance sector

Performance-related pay is more common in some sectors and occupations than others due to the role employees perform in generating sales or increasing production. For example, piece rate work is often associated with production line manufacturing while commission on sales is common in Retail. The British economy has a larger Finance sector than most developed economies due to the role of the City of London as a centre for listing and trading public listed company shares and for trading and investment more generally. Bonuses are an important method by which firms recruit, retain and motivate bankers, traders and other corporate executives. Some have identified bonus payments to bankers as an important component of recent growth in wage dispersion in Britain (Bell and Van Reenen, 2013), while others have speculated whether any increase in the bonus gearing of payments to traders may have induced risky behaviours which may have contributed to the recent financial crisis. Given the size of the Finance sector in Britain and the traditionally important

role of bonuses in the sector we hypothesise that bonus activity in the Finance sector may have played an important role in explaining economy-level movements in bonuses in Britain.

3. Data

Our results are based on analyses of the Monthly Wages and Salaries Survey (MWSS). The MWSS is conducted each month by the Office for National Statistics and provides data for around 8,500 enterprises in Britain. The sample of enterprises (strictly, reporting units) is drawn from the Inter-Departmental Business Register according to a variable probability design. A census is conducted among enterprises with 1,000 or more employees; the sampling fractions then decline through three further strata (500-999 employees; 100-499 employees; and 20-99 employees). Enterprises with fewer than 20 employees are not included in the survey. The survey covers all industries. Our data cover the period January 2000 to March 2013.

The survey contains data on total gross pay for the enterprise in the survey month, as well as the amount of bonus/commission (i.e. PRP) included in total gross pay. Separate totals are collected for all weekly-paid and all monthly-paid employees.[vi] Bonuses are measured by the survey in the month of payment, rather than during the period over which they are earned. All bonuses are included, with respondents being instructed to include: bonuses; commission; performance pay; annual profit from profit-related pay schemes; long-service awards; and – for sporting professions – appearance money. Changes in the way the data were collected mean there is a clear likelihood of under-reporting before the year 2000, so we begin our analysis of MWSS at this point.

Participation in the survey is compulsory and so a high response rate is achieved (around 85 per cent each month). Enterprises with 1,000 or more employees thus typically appear in the survey dataset each month. Enterprises which enter the sample with 20-999 employees are retained for up to five years before being rotated out. It is therefore possible to observe many individual firms at monthly intervals over a considerable period of time, and so to observe changes in the size of bonus payments within firms, both within and across years.

Whilst our analysis is based on the MWSS microdata provided via the UK Secure Data Service, we can confirm that we are able to use these microdata to replicate ONS' published statistics for Average Weekly Earnings (for which MWSS is the source).

In regression analyses we link the MWSS reporting units to their associated enterprise records in the Business Structure Database (BSD) – an annual extract from the UK's official business register – as a means of extending the list of firm characteristics, which is limited in

MWSS. This linkage is feasible for around 95 per cent of all MWSS records, and at least 85 per cent in each year.

4. Results

Figure 1 presents data from the MWSS showing the average real wage bill per employee in each month from January 2000 through to March 2013 for the whole economy. The chart shows separate series which include and exclude bonus payments. The figures are in British pounds per week at 2012 prices. The spikes in bonus payments capture the within-year variation that is caused by the timing of annual bonuses, typically paid in the period between December and March to reflect individual or collective performance over the previous 12 months.

Base pay rises gently until the onset of recession in July 2008 when it flattens and then begins to fall. Total pay follows a similar pattern, but the rise in total pay steepens between 2005 and 2008, with bonus pay appearing to constitute a rising percentage of total pay in this period. The fall in total pay in 2008/9 also seems sharper than that seen in base pay. Nonetheless, whereas base pay continues to be subdued in 2010, bonus pay bounces back – albeit not to its pre-recession peak. Figure 2 charts the share of total pay that is attributed to bonus payments and confirms that this share rose in the mid 2000s (particularly between 2005 and 2008). The share fell back in 2009 – although only to the level seen in the first half of the decade – before regaining much of its ground in 2010. After this point, end-of-year bonuses appear to fall slightly, whilst it appears that those paid at other points in the year may have risen.

[INSERT FIGURES 1 AND 2 HERE]

The broad patterns are thus evident from Figures 1 and 2, but the exact scale and timing of the changes is difficult to discern from the charts because of the seasonality of bonus payments. To show these movements more clearly, we aggregate the monthly data into the two bonus seasons, namely the "low season" which runs from April to November, when bonus payments typically average around five per cent of total wages, and the "high season" which runs from December to March, when they typically average around ten per cent. Figure 3 then charts the growth rate in the bonus share between one season and its equivalent in the following year (e.g. the first bar shows that the bonus share in the high season of 2001 was proportionally 14 per cent larger than the bonus share in the high season of 2000).[vii] The chart shows that the growth rates in the mid-2000s were similar irrespective of the season. The absolute growth in the bonus share was larger within the ‘high season’ series: the share rose from a low of 8.2 per cent in 2003 to a peak of 13.1 per cent in 2007, whereas “low season” bonuses rose from 3.6 per cent to 5.0 per cent over the same period. However the

proportionate growth in each series was similar. The chart also confirms that there has been no consistent pattern over the last three years of our series.

[INSERT FIGURE 3 HERE]

These movements in the bonus share are intriguing and, intuitively, we can expect that they may arise through a number of different mechanisms. One possible explanation for the growth in the mid-2000s is that there was an expansion in the share of all firms using PRP, with a consequent decline in the share of firms paying only fixed wages. Another possibility, which might intuitively explain some of the cyclicality in the bonus share, is that there have been changes in the size of bonuses paid out by PRP firms. We can therefore better understand the causes of movements in bonus payments if we decompose the bonus share into its constituent components.

In any given economy, the share of all wages paid out in bonuses in period *t* (the 'bonus share' for period *t*, or B_t) is computed as the ratio between the sum of all bonus payments (Bon_t) and the sum of all wages ($TotWage_t$). That is:

$$B_t = \frac{Bon_t}{TotWage_t} \quad (1)$$

The sum of all bonus payments in period *t* can be written as:

$$Bon_t = G_t^B . \bar{r}_t^B . E_t^B \quad (2)$$

Where:

E_t^B is the total number of employees in firms that paid bonuses in period *t*

$\bar{r}_t^B$ is average regular (or base) pay per employee in these firms in period *t*

G_t^B is the multiple of all regular pay that is added to the wage bill in the form of bonus payments in bonus-paying firms (that is, the gearing of bonus pay to base pay within bonus-paying firms). This gearing is necessarily zero in non bonus-paying firms (G_t^N=0).

Similarly, the sum of all wages paid out in the economy can be expressed as the sum of: all bonuses paid out in bonus-paying firms; all regular pay paid out in bonus-paying firms; and all regular pay paid out in non bonus-paying firms. That is:

$$TotWage_t = G_t^B . \bar{r}_t^B . E_t^B + \bar{r}_t^B . E_t^B + \bar{r}_t^N . E_t^N \quad (3)$$

Where:

E_t^N is the total number of employees in firms that did not pay bonuses in period *t*

$\bar{r}_t^N$ is average regular (or base) pay per employee in these firms in period *t.*

Let RP_t refer to the ratio between average regular pay per employee in bonus-paying firms and average regular pay per employee in non bonus-paying firms. We call this the 'regular pay premium' (or 'base pay premium') in favour of the average employee in a bonus-paying firm:

$$RP_t = \frac{\bar{r}_t^B}{\bar{r}_t^N} \tag{4}$$

And let EP_t refer to the ratio between total employment in bonus-paying firms and total employment in non bonus-paying firms. We call this the 'employment premium' in favour of bonus-paying firms:

$$EP_t = \frac{E_t^B}{E_t^N} \tag{5}$$

Substituting (2) and (3) into (1) and dividing all terms through by $\frac{1}{\bar{r}_t^N.E_t^N}$ we then obtain the following:

$$B_t = \frac{G_t^B.RP_t.EP_t}{G_t^B.RP_t.EP_t + RP_t.EP_t + 1} \tag{6}$$

The aggregate bonus share in the economy (the share of all wages attributed to bonus payments) is thus a function of:

(a) The ratio of employment in bonus paying firms to employment in non-bonus-paying firms (the employment premium in favour of bonus-paying firms) (EP_t)

(b) The ratio of average base pay per employee in bonus-paying firms to average base pay in non-bonus-paying firms (the base pay premium) (RP_t), and

(c) the gearing within bonus-paying firms (the multiplier that bonus-paying firms notionally apply to base pay) (G_t^B).

For instance, if the employment premium is 1.10 (bonus-paying firms employ 52.5% of all employees in the economy), the pay premium is 1.05 (average base wages in bonus-paying firms are 5% higher than in non bonus-paying firms), and bonus-paying firms pay out bonuses to the value of 10% of base pay (a gearing of 0.10, which implies that total pay is 1.10 times the value of base pay), then the overall share of wages attributable to bonus payments is 5.1%.

Tracking the movement in each of these three series over time indicates whether one component has moved more than another over the period in question; Figure 4 shows the

monthly trend over our period of observation. It is apparent that the most substantial change - both from month to month and over time - is in the gearing of bonus pay to base pay in PRP firms. The ratio of base pay in PRP and non-PRP firms is flat in comparison. The employment ratio is also relatively flat overall, but drifting slowly downwards. The suggestion here is that firms' propensity to pay PRP has, if anything, been declining, but that movements in the gearing of bonus pay to base pay are at least as important in understanding changes in the economic importance of performance pay over time.

[INSERT FIGURE 4 HERE]

The broad changes are again easier to discern if the monthly data are aggregated into bonus seasons. Figures 5 and 6 undertake this aggregation and also index each of the three series on the year 2000 (i.e. 2000 = 100). Changes in the gearing within PRP firms are the dominant feature of both the "high" and "low" season charts.

[INSERT FIGURES 5 AND 6 HERE]

We use the values underlying Figures 5 and 6 as the basis for a shift-share analysis in order to show the influence of changes in EP_t, RP_t and G_B in explaining changes in the total share of the wage bill accounted for by bonuses (B). This analysis is presented in Table 1 and confirms that it is the change in gearing - that is, the ratio of bonuses to base pay within the PRP sector - that explains most of the changing contribution of bonus pay to total pay. The fourth row in Part A of the table shows, for example, that the bonus share (B) fell by 4.38 percentage points between the high season of 2007 and the high season of 2009, and that 4.29 percentage points of this fall could be attributed to the decline in the gearing (G) from 27.3% in 2007 to 17.5% in 2009; the fall in the employment premium (EP) from 1.16 to 1.14 accounted for the remaining 0.13 percentage points of the overall decline in B. Indeed, in each row of Table 1 we see that changes in the relative size of the PRP and non-PRP sectors, and changes in the relative levels of base pay in the two sectors, contribute relatively little to changes in the overall bonus share when compared with the influence of changes in the gearing in PRP firms. This is the case in both the "high" and "low" seasons.

[INSERT TABLE 1 HERE]

To see whether compositional changes in the firm population - such as a shift in the sectoral profile of employment - can account for changes in the bonus share – or its major determinant, the gearing - we switch to regression models. These regressions focus on the annual movement in the gearing (G) and bonus share (B), within each season, after controlling for a range of firm characteristics taken from the MWSS and BSD.[viii] The reference year for this examination of time trends is 2003. Figure 7 shows the annual

coefficients from these regressions after controlling for compositional changes, confirming statistically significant increases in each series over the mid-2000s. The full results are presented in Appendix Table A1.[ix]

[INSERT FIGURE 7 HERE]

Table 1 (Part A, column 5) showed that, in the "high" season, there was a statistically significant increase of about 5 percentage points in the total pay bill accounted for by bonuses between 2003 and 2008. Figure 7 (upper right panel) shows that just under half of this is accounted for by compositional change in firms, but there remains a statistically significant rise of almost three percentage points in the bonus share over the period.[x] Correspondingly, none of the 11 percentage point high-season increase in the gearing of bonuses to base pay over the same period can be accounted for by compositional changes. Similar trends are apparent in the "low" season, though the magnitudes are smaller.

We infer from the analysis above that there was a growth in the economic importance of PRP in Britain in the mid-2000s. This arose through increases in the size of bonus payments relative to base pay in PRP firms, rather than a growth in the proportion of all firms using PRP. It was not merely the product of changes in the make-up of the economy. .

As the employment series in Figures 5 and 6 look broadly flat during the period in the mid-2000s when the bonus share was growing, this suggests that individual firms were changing their behaviour in respect of bonuses over this period. The alternative proposition is that the growth in the bonus share arose from significant churning in the population (i.e. entry and exit from the PRP sector). We find that this is not the case. Table 2 shows that, within the subset of firms that we observe paying PRP in both periods (2003 and 2007), the same increase in gearing was evident as seen among the population at large. Put simply, the aggregate changes were not merely the product of switching or entry and exit; instead changes in the gearing of bonuses to base pay within continuing firms were economically the more important feature of the PRP landscape over this period.

[TABLE 2 HERE]

Turning back to the aggregate trend in bonus payments, the fact that the rise in the bonus share ceased in 2008 with the onset of recession indicates some pro-cyclicality in bonus payments which exceeded any pro-cyclicality in base pay. To investigate this issue further, we augmented our dataset with a measure of monthly GDP (NIESR, 2015) and examined the relative elasticities of bonuses and base wages with respect to movements in national output. The output measure is the three-month moving average of monthly GDP. We compute the monthly growth rate in this three-month moving average and use this as our indicator of the

business cycle. From our MWSS dataset we compute the equivalent three-month moving averages for total pay, bonus pay and base pay per employee, along with the three-month moving average of the bonus share (the share of all wages paid out as bonuses in the economy in a given month). We then compute the monthly growth rate in each of these measures and regress each in turn on the growth rate in GDP, adding month fixed effects to each regression in order to control for the strong seasonality in total pay and bonus pay. The results are presented in Table 3. They show that bonuses are indeed more responsive than base pay to the business cycle. This is evident both in the fact that the elasticity of total payments with respect to changes in GDP is greater than the elasticity of base pay (the coefficients in models 1 and 3 are statistically significant from one another at the 5% level: κ^2=4.64, p=0.03), and also in the fact that movements in the bonus share and GDP are positively correlated (p=0.048).

[TABLE 3 HERE]

So far our analyses have been conducted for the whole economy but, as noted earlier, the Finance sector has traditionally played an important role in bonus payments in Britain. The Finance sector is important in any discussion of performance pay because its firms are the most likely of those in any sector to pay bonuses and those bonuses tend to be very large. Table 4 shows the economic significance of the Finance sector in respect of bonuses, by computing the share of all bonus pay – and the share of all base pay - that was paid out to Finance sector workers in our sample period. The share of all bonus pay going to workers in the Finance sector is around two-fifths, but in contrast, they account for only 7 per cent of base pay. Finance is the dominant player in the aggregate picture on bonuses in the British economy.

[INSERT TABLE 4 HERE]

This raises a question about the size and direction of movements in the gearing and the bonus share across the economy, once the dominant influence of Finance is removed. Repeating our regression analysis after having excluded firms from the Finance sector, we find the trends are much less dramatic than for the whole economy: there is still some growth in bonus pay, but it is considerably smaller in absolute terms. Again, however, it is changes in the gearing that are critical in driving the overall picture. Without Finance, the bonus share in the economy rises by around 1 percentage point between 2003 and 2007 in both the high and low-season series. All of this increase is caused by changes in the gearing of bonuses to base pay within the PRP sector, which rises by around 2 percentage points in either series. There is then a countervailing effect which arises from a decline in the size of the PRP sector (which is similar in magnitude to the whole-economy decline shown in Table 2).[xi]

What these results highlight is that much of the dramatic change in the bonus share seen in the economy at large can be attributed to movements in the gearing ratio of bonuses to base pay within the Finance sector. Outside the Finance sector, the changes have been considerably more modest. But even here, the gearing (the multiplier that PRP firms opt to apply to the fixed part of their wage bill when deciding on the total amount of remuneration in the firm) is the key factor. And whilst the variations are less important economically once one moves outside of Finance, the broad trends are nonetheless similar.

5. Conclusion

Despite its potential to raise productivity, performance-related-pay (PRP) is not widespread in market-oriented economies. Furthermore, despite secular changes conducive to its take-up, there is mixed evidence as to whether it has become more prominent over time. Ours is the first paper to present firm-level data for the Britain on both the incidence and size of bonus payments in the 2000s. We decompose the share of the total wage bill accounted for by bonuses into the shares of employment in the PRP and non-PRP sectors, the ratio of base pay between the two sectors, and the gearing of bonus payments to base pay within the PRP sector. We hypothesise that there will have been a secular rise in the use of PRP in Britain and show that there was some growth in the share of total pay accounted for by bonuses in Britain in the mid-2000s. However this rise – and subsequent fluctuations since the onset of recession in 2008 – can be almost entirely explained by changes in the gearing of bonus to base pay within the PRP sector. There has been no substantial change in the percentage of employment accounted for by PRP firms; if anything it has fallen over the past decade.

As the share of wages paid out in bonuses fell in recession, this suggests that bonuses are procyclical. We show that this is indeed the case by augmenting our dataset with a measure of national output and demonstrating that the cyclicality of bonuses is greater than for base pay. Finally, we hypothesise that aggregate patterns of PRP in Britain will be heavily influenced by practice in the Finance sector. We show that the Finance industry accounts for a large proportion of all bonus payments in the British economy, and we also show that the movements in the gearing of bonuses to base pay in the economy at large are considerably muted once the Finance sector is set aside. . One implication is that further research is needed on how firms – particularly in Finance but also elsewhere in the economy – decide upon the appropriate size of bonus payments for their workers from one period to the next.

References

Bandiera, O., Barankay, I. and Rasul, I. (2007) “Incentives for Managements and Inequality Among Workers: Evidence from a firm-level experiment” *The Quarterly Journal of Economics*, 122(2): 729-773

Bell, B. and Van Reenen, J. (2010) "Bankers and Extreme Wage Inequality in the UK", Special Paper No. 21, Centre for Economic Performance, London School of Economics, April.

Bell, B. and Van Reenen, J. (2011) "Firm Performance and Wages: Evidence from Across the Corporate Hierarchy", Discussion Paper No. 1088, Centre for Economic Performance, London School of Economics, November.

Bell B. and Van Reenen J. (2013) “Bankers and their bonuses”, Occasional Paper No. 35, Centre for Economic Performance, London School of Economics, February.

Benabou R and Tirole J (2003) “Intrinsic and extrinsic motivation”, *Review of Economic Studies*, 70: 489-520.

Blanchflower D., Oswald A. and Sanfey P (1996) “Wages, profits and rent-sharing”, *Quarterly Journal of Economics*, 111, 1: 227-251.

Bryson, A. and Forth, J. (2011) “Trade Unions”, Gregg P. and Wadsworth J. (eds.) *The Labour Market in Winter: the State of Working Britain*, Oxford University Press, Oxford, pp.255-271.

Bryson, A., Freeman, R., Lucifora, C., Pellizzari, M and Perotin, V. (2013) "Paying for Performance: Incentive Pay Schemes and Employees' Financial Participation", in Boeri T., Lucifora C. and Murphy K. (eds.) *Executive Remuneration and Employee Performance-related Pay: A Transatlantic Perspective*, Oxford University Press, Oxford, pp.123-268.

Dohman T and Falk A (2011) “Performance pay and multidimensional sorting: productivity, preferences and gender”, *American Economic Review*, 101: 556-590.

Dube, A. and Freeman, R. B. (2010), "Complementarity of Shared Compensation and Decision Making Systems: Evidence from the American Labor Market", in Kruse D., Freeman R. and Blasi J. (eds.) *Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing and Broad-based Stock Options*, University of Chicago Press, Chicago, pp.167-200.

[Reference omitted for blind refereeing]

Freeman, R. and Kleiner, M. (2005), “The Last American Shoe Manufacturers: Decreasing Productivity and Increasing Profits in the Shift from Piece Rates to Continuous Flow Production,” *Industrial Relations*, 44(2): 307-330.

Frick B, Goetzen U and Simmons R (2015) “The hidden costs of high-performance work practices: evidence from a large German steel company”, *Industrial and Labor Relations Review*, 66, 1: 198-224.

Gittleman, M. and Pierce, G. (2013a) "How Relevant is Performance Related Pay in the United States? Current Incidence and Recent Trends", *National Institute Economic Review*, No. 226, November, R4-R16.

Gittleman, M. and Pierce, G. (2013b) "Pay for Performance and Compensation Inequality: Evidence from the ECEC", Working Paper 465, US Bureau of Labor Statistics, Washington, September.

Gregg, P. and Machin, S. J. (2012) *What a Drag: The Chilling Impact of Unemployment on Real Wages*, London: The Resolution Foundation.

Heywood, J. S. and Parent, D. (2012) "Performance Pay and the White-Black Wage Gap", *Journal of Labor Economics*, 30, 2: 249-290.

Heywood, J. S. and Parent, D. (2013) "Performance Pay, the Gender Earnings Gap and Parental Status", mimeo.

Kruse, D. L., Blasi, J. R., and Park, R. (2010), “Shared Capitalism in the US Economy: Prevalence, Characteristics and Employee Views of Financial Participation in Enterprises”, in Kruse D., Freeman R. and Blasi J. (eds.) *Shared Capitalism at Work: Employee Ownership, Profit and Gain Sharing and Broad-based Stock Options*, University of Chicago Press, Chicago, pp.41-76.

Lazear, E. (1986) “Salaries and piece rates” *Journal of Business*, 59: 405-31.

Lazear, E. (2000) "Performance pay and productivity", *American Economic Review*, 90: 1346-1361.

Lemieux, T., MacLeod, W. B. and Parent, D. (2009) "Performance Pay and Wage Inequality" *Quarterly Journal of Economics*, 124 (1): 1–49.

Levine D (1991) “Cohesiveness, productivity and wage dispersion”, *Journal of Economic Behaviour and Organisation*, 15, 2: 237-255.

Belfield R and Marsden D (2003) “Performance pay, monitoring environments, and establishment performance”, *International Journal of Manpower*, 24, 4: 452-471.

McGovern, P., Hill, S., Mills, C. and White, M. (2007) *Market, Class and Employment*, Oxford University Press, Oxford.

NIESR (2015) *NIESR Monthly Estimates of* GDP, May 2015, London: NIESR. Available online at: http://www.niesr.ac.uk.

Office for National Statistics (2011) *Average Weekly Earnings: Quality and Methodology Information Paper*, Office for National Statistics, Newport.

O'Halloran, P. (2013) "Union Coverage, Membership and Performance-related Pay: Are Piece Rates Different?" *National Institute Economic Review*, November, R1-R12.

Pendleton, A., Whitfield, K. and Bryson, A. (2009) ‘The changing use of contingent pay in the modern British workplace’, in Brown W., Bryson A., Forth J. and Whitfield K. (eds.) *The Evolution of the Modern Workplace*, Cambridge University Press, Cambridge, pp. 256-284.

Prendergast, C. (1999) ‘The provision of incentives in firms’ *Journal of Economic Literature*, 37, 1: 7 – 63.

Prendergast, C. (2000), “What Trade-Off of Risk and Incentives?”, *American Economic Review*, 90(2): 421-425.

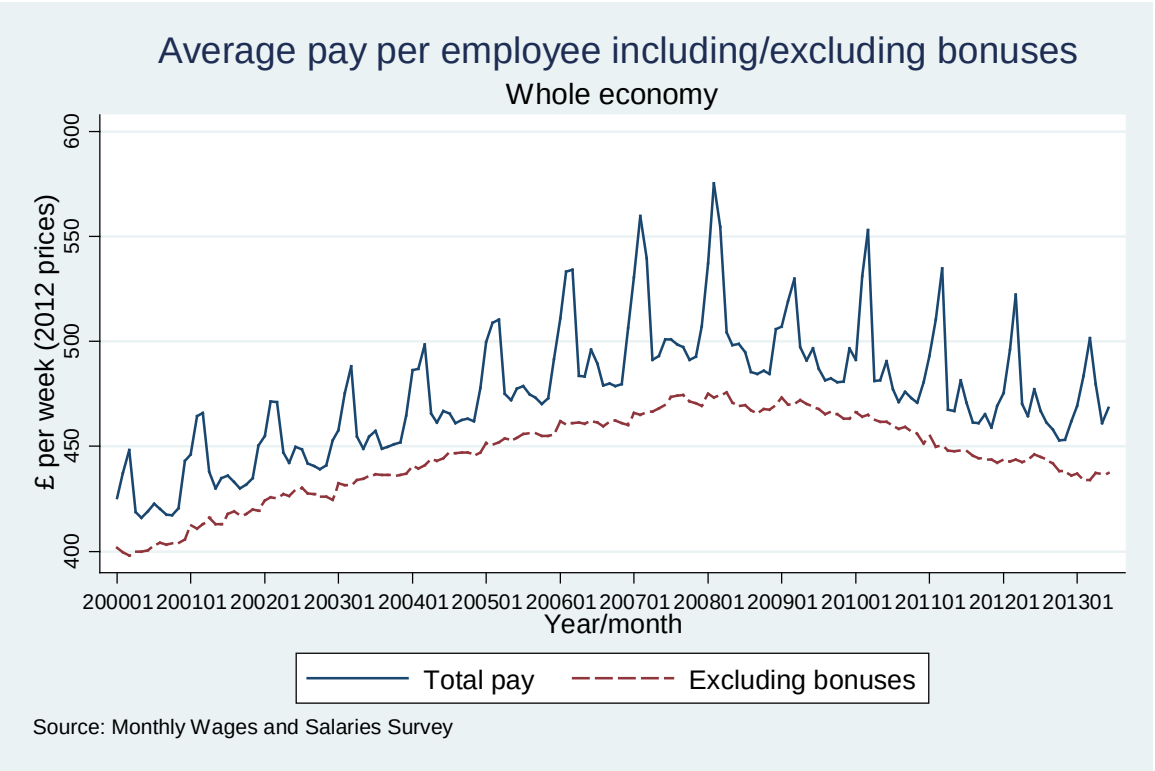
Prendergast, C. (2002a), “The Tenuous Trade-off between Risk and Incentives”, *Journal of Political Economy*, 110(5): 1071-1102.

Prendergast, C. (2002b), “Uncertainty and Incentives”, *Journal of Political Economy*, 20(2): S115-S137.

Shearer, B. (2004) "Piece rates, fixed wages and incentive effects: evidence from a field experiment", *Review of Economic Studies*, 71: 514-534.

Van Wanrooy, B., Bewley, H., Bryson, A., Forth, J., Freeth, S., Stokes, L. and Wood, S. (2013) *The 2011 Workplace Employment Relations Study First Findings*, Department for Business Innovation and Skills, London.

Figure 1: Total pay with and without bonuses, whole economy



Source: Monthly Wages and Salaries Survey

Figure 2: Bonuses as a percentage of the total weekly pay bill, whole economy

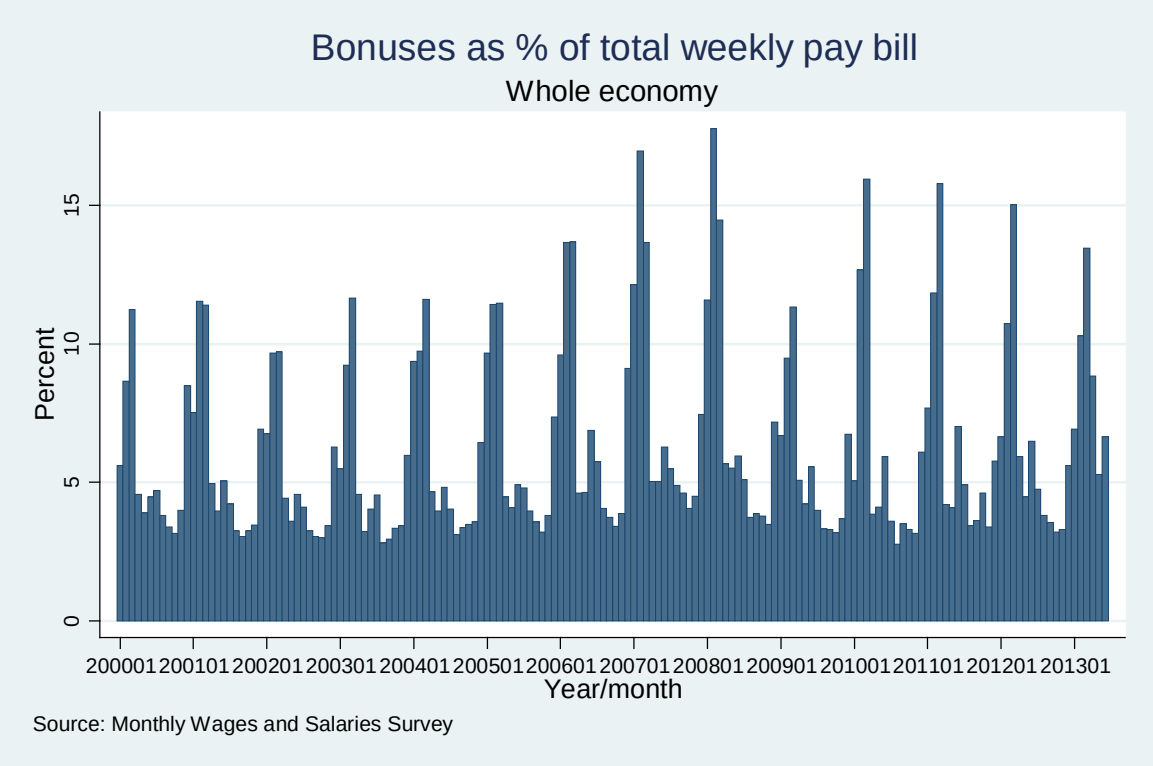


Figure 3: Growth rate in bonuses compared to previous season, whole economy

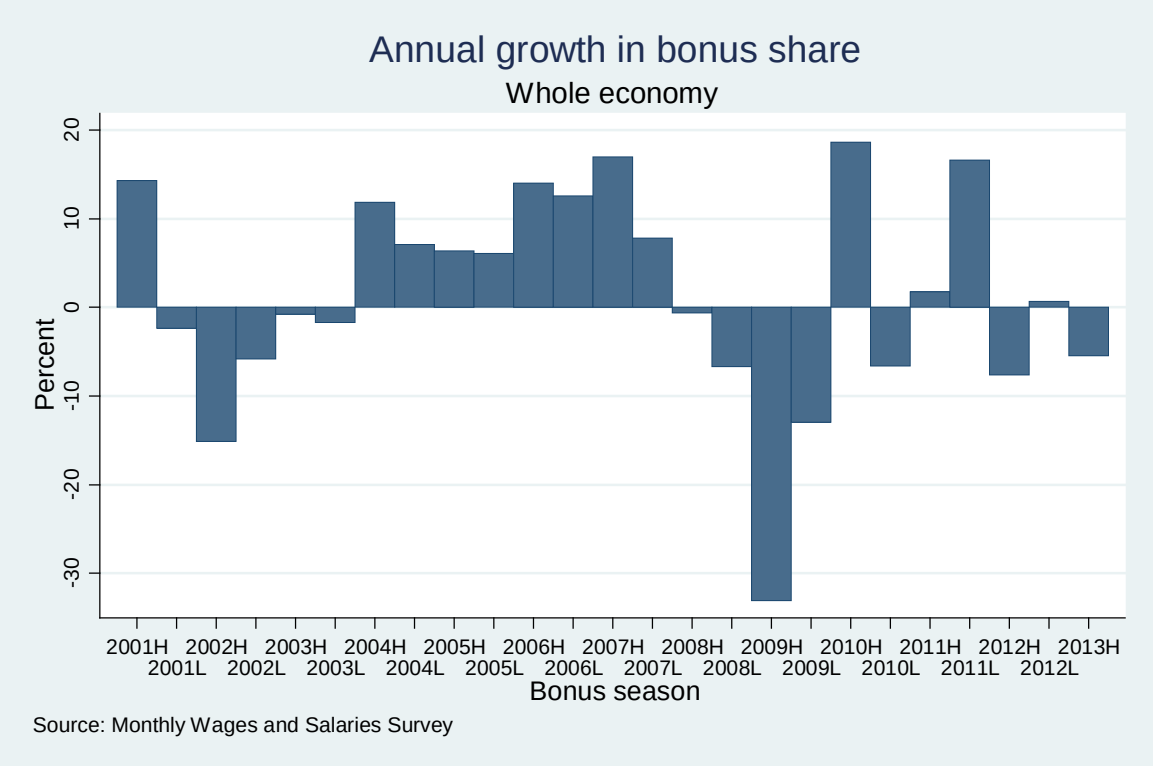
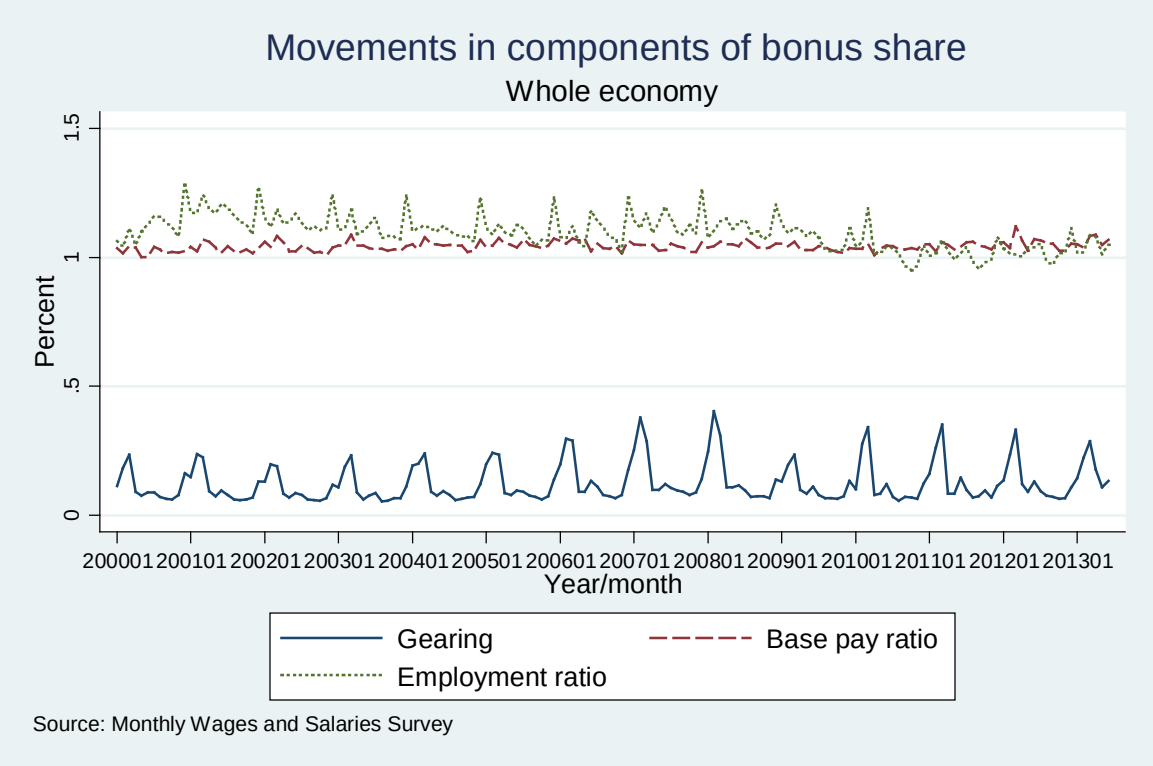
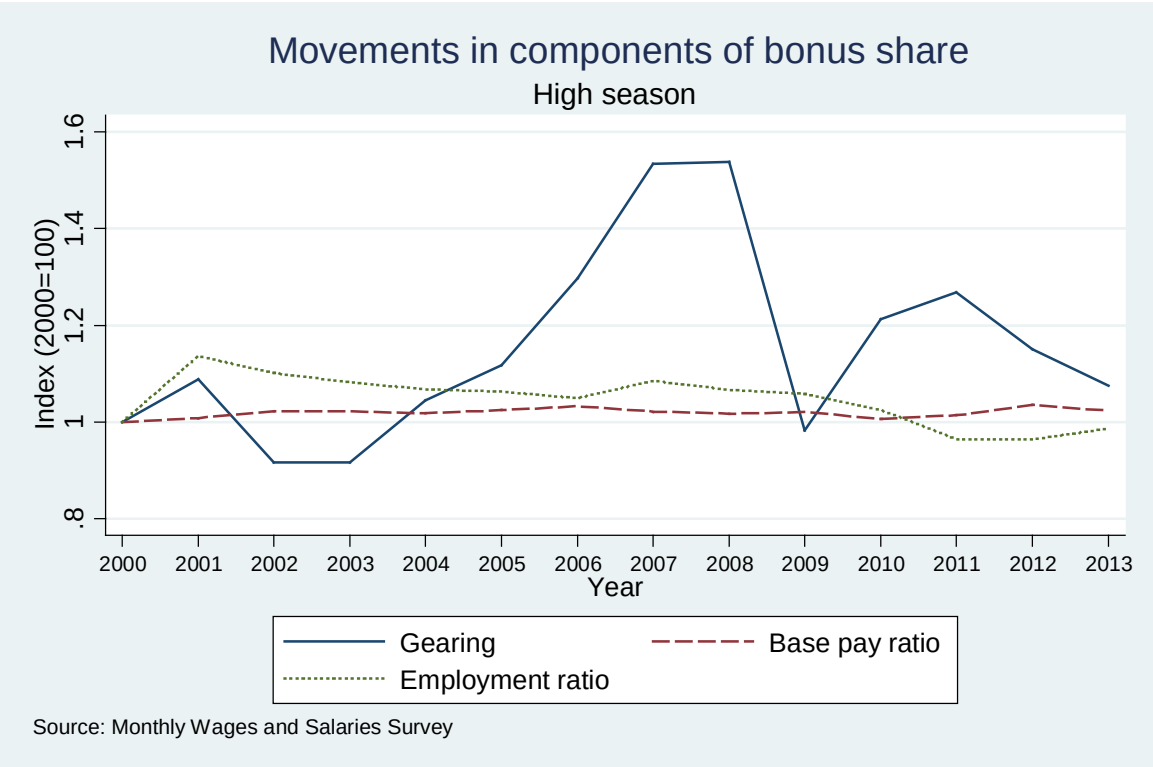


Figure 4: Decomposition of change in proportion of wage bill accounted for by bonuses



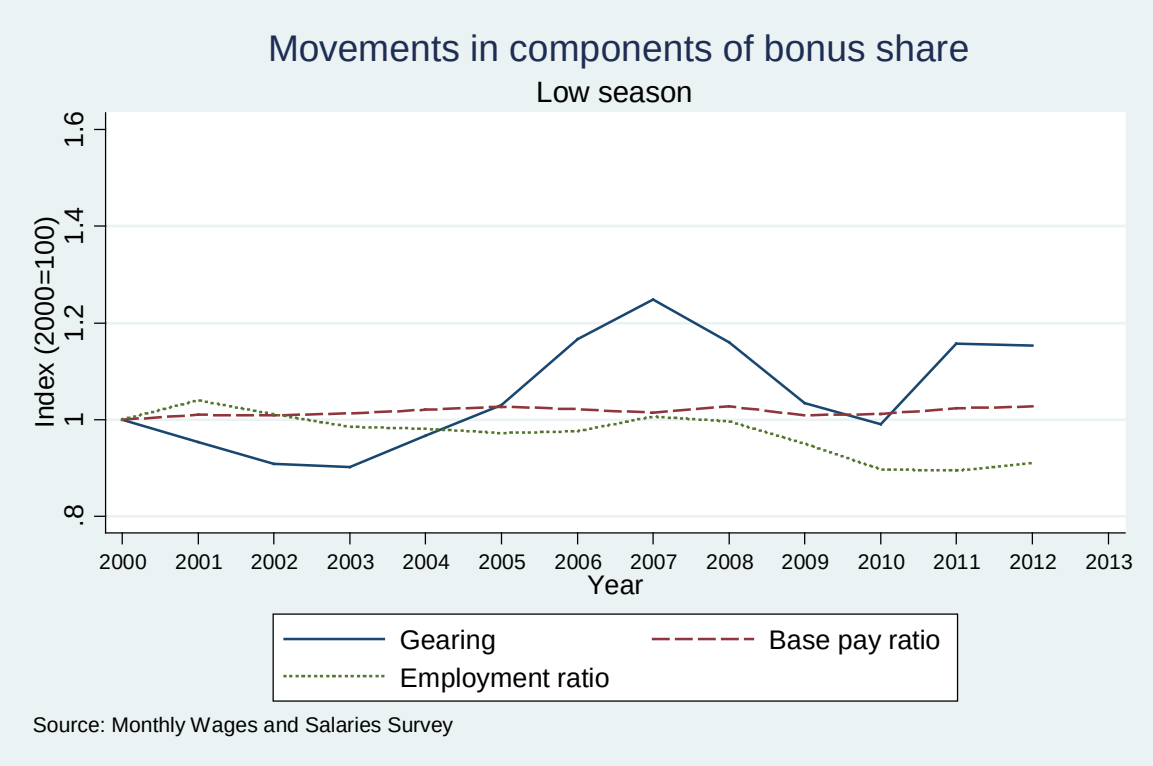
Source: Monthly Wages and Salaries Survey

Figure 5: Movement in components explaining change in bonus payments as percentage of total wage bill during "high" season (index where 2000=100)



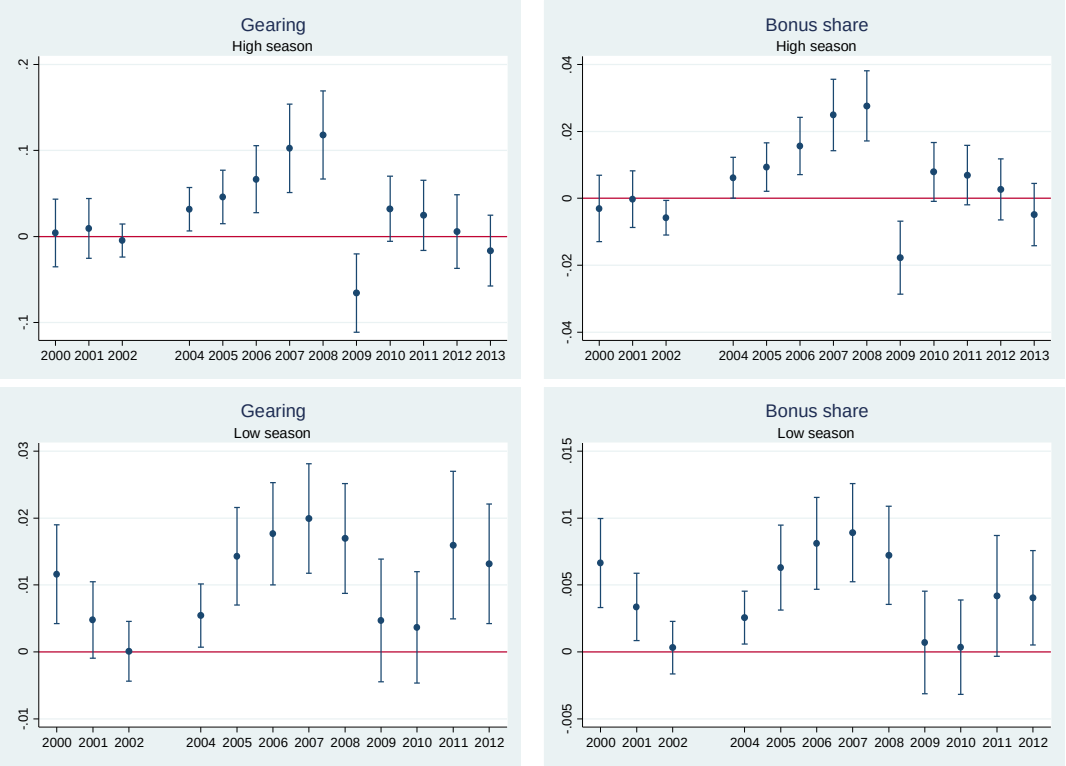
Source: Monthly Wages and Salaries Survey

Figure 6: Movement in components explaining change in bonus payments as percentage of total wage bill during "low" season (index where 2000=100)



Source: Monthly Wages and Salaries Survey

Figure 7: Movements in gearing and bonus share, high season and low season, after controlling for changes in the composition of the economy



Source: Monthly Wages and Salaries Survey

Notes: Point estimates represent coefficients from regressions with controls for changes in the composition of the economy (Reference = 2003). Capped bars show 95% confidence intervals. Full results are presented in Table A1.

Table 1: Shift-share analysis accounting for change in proportion of all pay accounted for by bonuses, selected years

Part A: High season

		EP	*RP*	G_B	*B*	Change in *B*	Due to *EP*	Due to *RP*	Due to G_B	Residual
Start	2000	1.07	1.03	17.8%	8.6%					
Trough	2003	1.16	1.05	16.3%	8.2%	-0.32	0.29	0.08	-0.66	-0.03
Peak	2007	1.16	1.05	27.3%	13.1%	4.84	0.01	0.00	4.83	0.00
Trough	2009	1.14	1.05	17.5%	8.7%	-4.38	-0.13	0.00	-4.29	0.04
Peak	2011	1.04	1.05	22.6%	10.5%	1.80	-0.34	-0.02	2.25	-0.08
End	2013	1.06	1.06	19.1%	9.2%	-1.32	0.10	0.04	-1.45	-0.02

Source: Monthly Wages and Salaries Survey

Part B: Low season

		EP	*RP*	G_B	*B*	Change in *B*	Due to *EP*	Due to *RP*	Due to G_B	Residual
Start	2000	1.12	1.02	7.8%	4.0%					
Trough	2003	1.10	1.03	7.0%	3.6%	-0.38	-0.03	0.02	-0.38	0.00
Peak	2007	1.12	1.04	9.8%	5.0%	1.37	0.03	0.00	1.32	0.01
Trough	2010	1.00	1.03	7.7%	3.8%	-1.20	-0.25	-0.01	-0.99	0.05
End	2012	1.02	1.05	9.0%	4.4%	0.66	0.03	0.03	0.60	0.01

Source: Monthly Wages and Salaries Survey

Table 2: Variations in gearing, 2003 and 2007

	High season		Low season	
	2003	2007	2003	2007
Firms paying PRP in both years	15%	25%	7%	10%

Source: Monthly Wages and Salaries Survey

Table 3: The elasticity of bonus pay and base pay with respect to changes in GDP

	[1] Δ Average total pay per employee	[2] Δ Average bonus pay per employee	[3] Δ Average base pay per employee	[4] Δ Bonus share
Δ Monthly GDP	0.535*	5.144*	0.204**	4.394*
	[2.55]	[2.06]	[2.89]	[1.99]
Observations	*159*	*159*	*159*	*159*

t-statistics in brackets; *p<0.05, **p<0.01, ***p<0.001
Source: Monthly Wages and Salaries Survey and NIESR (2015)
See text for variable definitions.

Table 4: Sectoral shares of all base pay and bonus pay, Jan 2000 – March 2013

	NACE Rev 1.1 Section(s)	Share of all bonus pay	Share of all regular pay
Finance	J	39%	7%
Other private services	G-I, K, O	45%	45%
Production	A-F	15%	21%
Public services	L-N	1%	26%
Total		100%	100%

Source: Monthly Wages and Salaries Survey

Appendix A

Table A1: Regressions for employment share, gearing and bonus share in "high" and "low" seasons, whole economy

High season	1	2	3	4	5	6
	Gearing	**Gearing**	**Gearing**	**Bonus share**	**Bonus share**	**Bonus share**
Sample:	*All*	*BSD-linked*	*BSD-linked*	*All*	*BSD-linked*	*BSD-linked*
Controls:	*No*	*No*	*Yes*	*No*	*No*	*Yes*
2000	0.015	-0.002	0.004	0.003	-0.002	-0.003
	[1.03]	[-0.11]	[0.21]	[0.50]	[-0.33]	[-0.60]
2001	0.031*	0.010	0.009	0.015*	0.006	0.000
	[2.20]	[0.73]	[0.53]	[2.41]	[1.05]	[-0.06]
2002	0.000	0.005	-0.005	0.001	0.003	-0.006*
	[-0.00]	[0.65]	[-0.48]	[0.20]	[0.89]	[-2.21]
2003	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2004	0.023*	0.030*	0.032*	0.010*	0.011*	0.006*
	[2.33]	[2.27]	[2.47]	[2.20]	[2.14]	[1.97]
2005	0.036**	0.040*	0.046**	0.016**	0.016*	0.009*
	[3.15]	[2.52]	[2.88]	[3.08]	[2.45]	[2.52]
2006	0.068***	0.067**	0.067***	0.029***	0.027***	0.016***
	[4.22]	[3.26]	[3.35]	[4.38]	[3.32]	[3.57]
2007	0.110***	0.118***	0.103***	0.048***	0.046***	0.025***
	[4.68]	[4.09]	[3.91]	[5.25]	[4.31]	[4.58]
2008	0.111***	0.139***	0.118***	0.048***	0.053***	0.028***
	[5.00]	[4.85]	[4.52]	[5.60]	[5.13]	[5.19]
2009	0.012	-0.049**	-0.066**	0.005	-0.019**	-0.018**
	[0.99]	[-2.78]	[-2.83]	[0.85]	[-2.69]	[-3.18]
2010	0.053**	0.041	0.032	0.021**	0.012	0.008
	[3.07]	[1.91]	[1.66]	[2.88]	[1.43]	[1.76]
2011	0.063**	0.066**	0.025	0.023**	0.018*	0.007
	[3.02]	[2.83]	[1.18]	[2.84]	[2.16]	[1.54]
2012	0.042*	0.061**	0.006	0.015*	0.017*	0.003
	[2.55]	[3.26]	[0.26]	[2.33]	[2.38]	[0.58]
2013	0.028	0.031	-0.017	0.009	0.008	-0.005
	[1.73]	[1.63]	[-0.79]	[1.46]	[1.15]	[-1.02]
N	173,951	145,259	145,259	479,113	389,589	389,589
R-sq	0.001	0.003	0.109	0.005	0.007	0.409

t-statistics in brackets; *p<0.05, **p<0.01, ***p<0.001

Table A1 continued

Low season	1	2	3	4	5	6
	Gearing	**Gearing**	**Gearing**	**Bonus share**	**Bonus share**	**Bonus share**
Sample:	*All*	*BSD-linked*	*BSD-linked*	*All*	*BSD-linked*	*BSD-linked*
Controls:	*No*	*No*	*Yes*	*No*	*No*	*Yes*
2000	0.008	0.012***	0.012**	0.004	0.005***	0.007***
	[1.95]	[3.56]	[3.08]	[1.91]	[3.47]	[3.92]
2001	0.004	0.007*	0.005	0.003	0.004**	0.003**
	[1.12]	[2.55]	[1.63]	[1.56]	[3.05]	[2.62]
2002	0.001	0.002	0.000	0.001	0.001	0.000
	[0.18]	[0.96]	[0.04]	[0.41]	[1.18]	[0.32]
2003	Ref.	Ref.	Ref.	Ref.	Ref.	Ref.
2004	0.005*	0.005*	0.005*	0.003	0.002	0.003*
	[1.98]	[2.05]	[2.26]	[1.90]	[1.88]	[2.53]
2005	0.010**	0.014***	0.014***	0.005*	0.006***	0.006***
	[2.63]	[3.62]	[3.84]	[2.55]	[3.68]	[3.89]
2006	0.021***	0.020***	0.018***	0.010***	0.009***	0.008***
	[4.48]	[5.00]	[4.54]	[4.48]	[5.05]	[4.64]
2007	0.027***	0.023***	0.020***	0.014***	0.010***	0.009***
	[5.09]	[5.38]	[4.79]	[5.33]	[5.49]	[4.75]
2008	0.020***	0.022***	0.017***	0.010***	0.009***	0.007***
	[4.23]	[5.00]	[4.04]	[4.54]	[4.87]	[3.85]
2009	0.010*	0.009	0.005	0.004*	0.002	0.001
	[2.20]	[1.82]	[1.00]	[2.00]	[1.19]	[0.36]
2010	0.007	0.011*	0.004	0.002	0.002	0.000
	[1.32]	[2.17]	[0.86]	[0.68]	[1.04]	[0.20]
2011	0.020**	0.026***	0.016**	0.008*	0.008**	0.004
	[2.76]	[3.88]	[2.83]	[2.45]	[2.78]	[1.82]
2012	0.020**	0.025***	0.013**	0.008**	0.008***	0.004*
	[3.05]	[4.80]	[2.88]	[2.86]	[3.83]	[2.24]
N	304,073	264,904	264,904	889,673	759,490	759,490
R-sq	0.001	0.002	0.048	0.002	0.001	0.100

t-statistics in brackets; *p<0.05, **p<0.01, ***p<0.001
Source: Monthly Wages and Salaries Survey (Jan 2000 – Mar 2013)

ENDNOTES

[i] The WERS survey, in contrast, offers only two time points since 2000 (i.e. 2004 and 2011). The MWSS therefore offers considerable advantages in terms of being able to observe the periodicity and cyclicality of PRP.
[ii] As Prendergast notes (1999: 10), where a worker is paid a fixed salary in a given period "despite the fact that there is no immediate relation between pay and performance, he is likely to have incentives to exert effort because good performance will improve future contracts. Such reputational concerns imply that effort exertion can occur without explicit pay-for-performance contracts."
[iii] In agency theory the standard assumption is that firms are risk neutral while workers are risk averse. The choice of contract involves a trade-off between efficiency and insurance. With a fixed wage the worker is fully insured and exerts minimal effort, thus reducing efficiency. In a piece-rate contract the worker bears all the risk (no insurance), while eliciting higher effort and receiving higher earnings. Where output can vary stochastically workers will seek compensation for higher risk when moving from a fixed-wage to a piece-rate contract. In practice, most incentive pay schemes involve the combination of a base wage, which is fixed, and a variable component (Prendergast, 2000 and 2002a and 2002b).
[iv] The changing composition of the workforce accounts for almost one-third of the growth in PRP in the United States during the early 2000s, whereas all the growth in PRP in Europe occurs within-group (Bryson et al., 2013).
[v] Van Wanrooy et al. (2013) note a high incidence of pay freezes in the public and private sectors since the onset of recession which is consistent with greater cyclicality in earnings more generally.
[vi] For weekly-paid employees, the survey asks for total pay paid to employees in the last week of the month.
[vii] Note that the high season for 2000 is not a full season because it omits December 1999.
[viii] The controls are industry sector; base pay per employee (quartiles); foreign-ownership; legal status; age; organisation size - employment; organisation size - number of sites; region.
[ix] For each dependent variable, Table A1 first presents estimates for the full sample used in all figures presented above, in which the only regressors are the year dummies (see columns 1 and 4). Table A1 then goes on to present estimates from the BSD-linked sample without controls and with the removal of all imputed values in MWSS (columns 2 and 5). The imputations are undertaken by the ONS, which uses real and imputed values in its construction of its measure of Average Weekly Earnings (ONS, 2011).These estimates then provide the benchmark for a more complete specification - presented in columns 3 and 6 - in which a range of firm characteristics taken from MWSS and the BSD are added in order to strip the year dummies of the effects of compositional change.
[x] This seems to be largely to do with removing the influence of industry. Finance accounts for a slightly larger share of wage-weighted employment between 2003 and 2007 and, although there are more sizeable shifts elsewhere (e.g. decline of manufacturing, growth of the education and health sectors), these are much less important than Finance in terms of bonus paying. A small increase in the size of the Finance sector is sufficient to make a sizeable impact on the overall trend.
[xi] Full results are provided in Table 5 of [reference omitted for blind refereeing – see supplementary file provided with text for the purposes of review].