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How Does Shared Capitalism Affect Economic Performance in the United Kingdom?

Alex Bryson and Richard B. Freeman

There are three reasons for exploring the impact of shared capitalism—employee shared ownership, payment via stock options, and profit sharing and related group incentive pay—on economic outcomes in the United Kingdom.

The first is that shared capitalism is widespread. Table 6.1 shows the incidence and coverage of the major shared capitalist modes of pay in Britain for private sector workplaces with five or more employees in the 2004 Workplace Employment Relations Survey. Around one-fifth of workplaces had some form of *employee share ownership* scheme. This is comparable to US figures as discussed in chapter 1. These schemes include the Save as You Earn (SAYE)—an all-employee plan that gives workers tax breaks when they save to purchase their employer's shares but that does not require that they purchase the shares; the share incentive plan (SIP)—an all-employee scheme that offers tax breaks for employees holding shares in the company for which they work; and the Company Share Option Plan (CSOP)—where companies can grant chosen employees or directors up to £30,000 of tax and national insurance advantaged share options. The majority of the stock

Table 6.1   Percentage of workplaces and employees covered by shared capitalism in the United Kingdom, 2004

	Workplaces (%)	Employees (%)
1. Stock ownership	20	32
Share schemes		
SIP	7	11
SAYE	12	21
CSOP	6	11
Others, including EMI	3	6
Coverage of schemes		
Managers only	3	4
1–99% nonmanagerial	3	6
100% nonmanagerial	14	22
2. Group-based payment by results	26	30
3. Profit-related pay		
Some	23	29
1–99% nonmanagerial	7	12
100% nonmanagerial	16	18
4. Number of schemes		
0	50	38
1	27	30
2	17	24
3	6	9
5. Individual variable pay		
Pay for individual PBR	34	43
Merit pay	16	26

Notes: Source Workplace Employment Relations Surveys. 2004 data relate to workplaces with 5+ employees. Details of the pay schemes are presented in the appendix.

ownership plans are open to all nonmanagerial employees in part because the tax code usually requires such coverage to obtain tax breaks.

Turning to profit sharing and related group incentive pay, one-quarter of workplaces had some form of *profit-related pay* for nonmanagerial employees, and one-quarter had some form of *group-based payment by results,* which is akin to gain sharing in the United States. This incidence is also comparable to the United States as discussed in chapter 1. The vast majority of share ownership schemes and over two-thirds of profit-related pay schemes cover all nonmanagerial employees. The percentage of employees with these schemes exceeds the percentage of workplaces with the schemes because larger workplaces are more likely to choose to pay workers in these ways.

The fourth row in the table combines the three group-level performance pay methods into an additive scale that takes the value 0 if the firm has none of these methods, 1 if it has one, 2 if it has two, and 3 if it has all three methods. It shows that half the firms have at least one scheme and that 62 percent of workers are covered by at least one scheme. Shared capitalism is, from this metric, as much part and parcel of the British capitalist economy

as it is of the American economy, where almost half of workers are covered by at least one scheme (chapter 1).

The last row of the table gives the proportion of workplaces and employees who receive variable pay as individuals either through pay for performance or through merit pay. We treat these modes of payment separately because the "sharing" is related to individual performance as opposed to group performance and is thus more akin to piece rate pay than profit sharing.[1]

The second reason for examining shared capitalism in the United Kingdom is that the amount and nature of shared capitalist arrangements have changed over time. Profit-related pay and share-ownership schemes grew in the 1980s, spurred by government tax incentives. Data from Pendleton, Whitfield, and Bryson (2009, tables 5 and 6) on workplaces with twenty-five employees or more show that the proportion of private sector workplaces with some shared capitalist scheme increased from 40 percent in 1984 to 63 percent in 2004. The proportion of firms having profit-related pay increased from 19 percent to 44 percent, the proportion having group pay for performance increased from 15 percent to 25 percent, and the proportion having employee ownership increased from 22 percent to 28 percent.

The third reason is that the UK government has encouraged shared capitalist modes of pay with favorable tax treatment over time. In the 1980s the Conservative government gave tax advantages to profit-related pay. Since 1997 the Labour government has given tax advantages to share ownership schemes at the expense of profit-related pay schemes, which became fully taxable.[2] Unlike the United States, which gives tax breaks for collective ownership of shares through Employee Share Ownership Plans (ESOPs), the United Kingdom gives breaks for individual share ownership. The HM Revenue and Customs estimates that for 2002 and 2003 the Treasury spent about £800 million in tax relief per annum on these schemes (Oxera 2007a, 3). To see whether this is justifiable the Treasury commissioned an extensive econometric study of the impacts of shared capitalism on productivity (Oxera 2007a, 2007b), whose findings we compare with ours shortly.

Our analyses use linked employer-employee data from the British 2004 Workplace Employment Relations Survey (WERS)[3] to estimate the impact of shared capitalism on productivity and to assess some of the mechanisms by which it produces different outcomes at different workplaces. The 2004 WERS provides cross-sectional information on some 1,500 private sector workplaces obtained from HR managers and from employees work-

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1. Factor analyses of the five types of performance pay—individual payments-by-results, merit pay, group payments-by-results, share ownership, and profit-related pay—identified two factors with eigenvalues above 1. Share ownership and profit-related pay load together, as do individual payments-by-results and merit pay. Group-level payments-by-results had a lower loading, which was pretty similar across the two factors.

2. For details: http://www.hmrc.gov.uk/stats/emp_share_schemes/menu.htm.

3. For full details of the survey see Kersley et al. (2006) and Chaplin et al. (2005).

ing in those workplaces. With the survey weights used throughout results are nationally representative of workplaces with five or more employees in Britain. These data provide an independent check on the results from the analysis of the General Social Survey and the NBER Shared Capitalism surveys used in previous chapters.

We find that:

1. Different forms of shared capitalist pay complement each other in the sense that firms are more likely to have them in combinations than if they chose forms of pay independently.

2. Firms change modes of compensation frequently, with some adopting schemes and others eliminating them so that the gross changes in schemes are far more numerous than the net changes.

3. Shared capitalist pay is positively associated with other forms of pay and workplace arrangements: individual payment by results, employer reports of devolving decision making to employees, using subjective appraisals of worker performance, monitoring of outputs, and reduced monitoring of workers.

4. Firms with shared capitalist pay, particularly with share ownership schemes, have higher labor productivity than firms without such forms of pay. The impacts of shared capitalism on productivity are larger when the firm combines several schemes.

6.1   Conceptual Issues

The traditional rationale for shared capitalist pay is that it aligns worker and employer objectives in maximizing output. To do this, shared capitalism must overcome free-rider problems associated with any group incentive system and deal with the fact that virtually any contingent pay, including piece rates for individuals, gives incentives for some forms of desirable behavior but not for other forms.[4] Principal/agent problems are ubiquitous in a world where contracts are necessarily incomplete. These issues are addressed in chapter 2 in the discussion of anti-shirking behavior.

Shared capitalism is normally associated with certain modes of work organization. Since firms that pay workers on the basis of firm or group performance do so in the hope of inducing them to take actions that improve firm performance, they are also likely to empower workers to make decisions that affect performance, particularly where the employee has private information about the production process. Group incentive pay may also be

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4. Annual profit-sharing bonuses may, for example, induce workers to try hard in the short run but to neglect activities that benefit the firm over a longer horizon. Worker ownership whose benefits do not reach workers until they retire may fail to induce workers to try hard in the present. Piece rates or tournaments can reduce cooperation and the sharing of knowledge at workplaces and even induce one worker to sabotage a rival.

used as an incentive for workers to share their knowledge about the production process with other workers and the employer (Levine and Tyson 1990; Jones 1987).

By contrast, giving workers greater decision-making power absent financial incentives might adversely affect motivation (Ben-Avner and Jones 1995): "they want me to do more without paying me more." And giving shared capitalist pay without greater decision-making power may also fail to affect productivity: "they are making my income risky by varying my pay with performance without giving me autonomy to raise performance."

Shared capitalist modes of pay should also be associated with a shift in management monitoring from watching what workers do to monitoring their final products. When the firm cannot readily observe effort but can monitor outputs, incentive pay related to outputs will motivate effort, substituting for monitoring effort. Shared capitalism may provide workers an opportunity for extra pay by substituting for costly monitoring in situations where it is *especially* difficult to monitor, which is consistent with gift exchange versions of efficiency wage theory. By contrast, when the firm finds it easier to monitor workers than to monitor output, we would expect the firm to use straight-time pay.[5] Indeed, Frederick Taylor viewed output-based pay as a mechanism for the avoidance of shirking.[6] The advent of information and communication technologies (ICT)-based monitoring, including on-line monitoring, electronic point-of-sale equipment, and electronic time recording gave management new tools to monitor previously difficult-to-monitor jobs and output, potentially making this interaction more important than in the past.[7]

Some analysts view individual pay for performance as the polar opposite of group incentive pay. Individual pay for performance is a form of piece rate that induces employees to improve their personal output (and maybe to sabotage the output of others if that might improve their chances for a promotion), whereas group pay induces them to work cooperatively with others. Either you work for yourself or you work for the group. Under some conditions, the two forms of pay may indeed be antithetical but under others individual pay for performance can complement group incentive pay. Consider a situation in which maximizing output and profits requires that workers do their own work *and* also help others. In this case management will need two instruments to induce workers to spend some time working on

5. Daniel and Millward (1983) argue "Traditionally the purpose of PBR systems of pay has been to encourage workers to increase effort and output. . . . In practice . . . there has been a tendency for PBR to become more an instrument of management control designed to ensure consistency of output" (205).

6. Gallie, Felstead, and Green (1998) show that control of workers through close supervision, pay incentives, and appraisal systems all grew in Britain in the late 1980s and early 1990s.

7. White et al. (2004, 100) estimated that in 2002 ICT-based monitoring systems were "already covering around half the workforce and appear to be spreading rapidly." Half of the workplaces with ICT monitoring were using it to evaluate individuals (96).

their own and some time working cooperatively. Just as profit-seeking managements mix imperfect objective measures of performance with subjective evaluation (Baker, Gibbons, Murphy 1994), management could mix pay for individual performance and pay for group performance to induce workers to undertake both activities. Management could even use individual pay for performance as a tool against the temptation to free-ride on the group.

The most far-reaching hypothesis in recent analyses of the effect of human resource management on productivity and labor practices is the "complementarities thesis" that advanced labor practices work most effectively when bundled together into a consistent high-performance workplace (Ichniowski et al. 1996; Pil and MacDuffie 1996). This hypothesis implies that firms should adopt shared capitalist modes of pay and complementary forms of work organization as a package rather than introducing them individually. Some analysts go further and link shared capitalism with the firm's competitive strategy (Huselid 1995; Schuler and Jackson 1987). They argue that firms that compete on the basis of the quality of output should be more attuned to group incentives than firms that compete on the basis of low cost of generic output, where piece rates might be more effective.

We examine the notion that shared capitalist modes of pay and work organization has important complementarities in two ways.

First, we test whether firms choose combinations of pay schemes in proportions that diverge from what we would expect had they chosen them as independent draws from separate urns. Under the null hypothesis, if 50 percent of firms have profit sharing and 50 percent have employee share ownership, the proportion of firms with both profit sharing and employee ownership would be 25 percent. If the complementary hypothesis is correct, the proportion of firms with both practices would exceed 25 percent, whereas if the forms are substitutes, the proportion with both practices would fall short of 25 percent. Using a regression design, we also examine whether individual pay for results, managerial monitoring, and worker decision making are related to shared capitalist modes of pay, other factors held fixed. If the complementary hypothesis is correct, the shared capitalist practices should have positive effects on worker-friendly practices and negative effects on hierarchical control practices.

Second, we follow the bulk of the complementary literature by estimating production functions that relate output to inputs, including modes of compensation, and test for complementary relations among modes of compensation. If the complementary hypothesis is correct, shared capitalist practices X and Z will have greater effects on output when they operate together than when they operate separately. This implies that the regression coefficient on interaction terms such as their product XZ should be positive.

As with other production function models, without identifiably exogenous variation in input variables—in this case shared capitalist pay as well as capital and labor inputs—the regression results are best interpreted as reflecting

associations among endogenous variables. Depending on the heterogeneity among firms, moreover, the associations could be affected by selectivity and thus differ from the associations we would get from randomly assigning compensation and practices among firms. Still, our two-part analysis—looking for complementary links in the combinations of shared capitalist modes of pay and looking for such links in production functions—provides a stronger test of the hypothesized positive effect of shared capitalism on outputs than would analysis of either combinations or production functions separately.

6.2   Combinations of Practices

Figure 6.1 uses a Venn diagram to display the incidence of combinations of profit-related pay, share ownership, and group-based incentives in private sector workplaces with five or more employees in the WERS 2004 data. Our test of complementarity in these data compares those proportions with the proportions that would result if the firm selected practices independently on the basis of the proportion in the entire sample. The bottom part of the figure gives the actual incidence of each element in the diagram and the incidence we would expect from the binomial distribution of independent draws based on the proportion of each mode in the population. Half of the workplaces have no group-based incentive payments, which is statistically significantly different from the 39 percent predicted from the independent hypothesis. Twenty-seven percent had one scheme compared to 43.5 percent predicted to have a single scheme; 17 percent of workplaces had two schemes, which is close to the 15.5 percent predicted to have two schemes, but 6.2 percent had all three schemes, which is over three times the 1.7 percent predicted to have three schemes. Thus, there were more workplaces at the extremes of the distribution than predicted, which is consistent with the idea that these schemes are complementary (although it is possible that managerial preferences or some other dynamic is at work).

Using the 1984 Workplace Industrial Relations Survey, which surveyed workplaces with twenty-five or more employees, we made similar computations for that year. These data show a pattern that is similar to that in 2004, albeit with much lower levels of the use of the various schemes. In 1984, 59.5 percent of workplaces had no form of shared capitalist pay compared to a predicted level of 52.9 percent; 25.3 percent had one form of the pay compared to a predicted 36.6 percent, whereas 13.7 percent had two such forms compared to a predicted 9.2 percent while 1.4 percent had three such forms compared to a predicted 0.7 percent. More workplaces had two or three forms of shared capitalist pay and more had zero forms of shared capitalist pay than predicted. In sum, the calculations for 1984 as well as for 2004 reject the null hypothesis that workplaces select shared capitalist modes of compensation independently in favor of the complementary hypothesis.

No form 50%

PRP
34%

14%

8%   6%

6%

8%   5%

3%
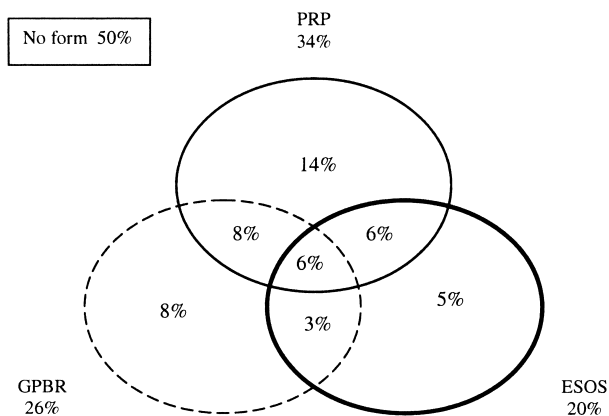
GPBR
26%

ESOS
20%

Actual and predicted incidence of Share Capitalism Practices

	Actual	Predicted
PRP	34.5	-
ESOS	19.6	-
GPBR	25.7	-
No scheme	49.7	39.1
Single scheme:	27.0	43.5
PRP	14.4	20.5
ESOS	4.6	9.5
GRPP	8.2	13.5
Two schemes:	17.0	15.5
ESOS & PRP	5.7	5.1
ESOS & GRPP	3.1	3.3
PRP & GRPP	8.2	7.1
Three schemes:	6.2	1.7

Fig. 6.1   Incidence of combinations of shared capitalist pay schemes, WERS 2004 (workplaces with five or more employees)

6.3   Changes in Modes of Pay

The 2004 WERS Panel provides panel data on a random subset of a nationally representative sample of workplaces with ten or more employees that the survey interviewed in 1998. The longitudinal file allows us to examine changes in shared capitalist modes of compensation over time. Rows 1 and 2 of table 6.2 record the incidence of different schemes in the panel data in 1998 and 2004. We differentiate the deferred profit-related pay systems from the others to highlight the fact that the incidence of profit-related pay declined due to the cessation of the tax advantage given to deferred

Table 6.2   **The distribution of shared capitalist forms of pay and proportion of workplaces changing their form of pay, 1998–2004 Panel of private sector workplaces with ten or more employees**

	PRP excluding deferred schemes	All PRP including deferred schemes	Employee share ownership schemes	Any PRP/ESOS	Payments-by-results
Distribution in %					
Distribution of all workplaces in 1998	42	47	20	48	23
Distribution of all workplaces in 2004	42	42	20	49	33
Net change	0	–5	0	1	10
Changes in distribution					
Did not have program in 1998 nor 2004	43	40	71	37	58
Added program between 1998 and 2004	15	18	9	14	9
Had program in 1998 but dropped it by 2004	15	13	10	15	18
Had program in both 1998 and 2004	27	29	11	34	15
Gross change	30	31	19	29	27

Source: Workplace Employment Relations Panel Survey 1998–2004.

profit-related pay schemes. The percentage with other profit-related schemes remained constant at 42 percent; the percentage of workplaces with employee share ownership schemes also remained stable, so that the primary increase in shared capitalist modes of compensation occurred through a 10 percentage point increase in group payments by results. The net change figures in row 3 show rather modest changes in the overall distribution.

But the part of the table labeled "changes in distribution" shows that beneath the stability in the nondeferred performance-related pay (PRP) schemes and in the employee share ownership schemes there is considerable switching among schemes by workplaces. Underlying the 42 percent constant proportion of workplaces with profit-related pay exclusive of the deferred schemes are shifts in nearly one-third of the workplaces: 15 percent of workplaces adopted profit-related pay while 15 percent ended schemes other than the deferred ones that lost tax privileges. Similarly, underlying the 20 percent constant percentage of workplaces with Employee Share Ownership Schemes (ESOS) is a change in 19 percent of workplaces. Even the group payments-by-results, which increased by 10 percentage points from 1998 to 2004, show a gross change of 27 percentage points.

How should we interpret this huge difference between net and gross changes? One interpretation of the high amount of switching is that it reflects experimentation on the part of employers in search of the best arrange-

ments. Another interpretation is that firms change practices because the optimal compensation system changes, perhaps because what matters to employers is the "newness" of a scheme rather than the attributes of a particular payment method. Whichever interpretation is right, it would seem that these changes are not major overhauls in employer practices, implying that the treatments and the inputs required to maintain them are unlikely to be large—that is, switching costs are low.

The substantial amount of switching may create problems for employee expectations. Employee cooperation may be encouraged by stable, well-known plans that create a common understanding of how employees will be rewarded. Shared capitalism can then help to cement long-term bonds between the employer and employees, and dropping or substantially altering these plans may undo the common understanding that underlies better performance. On the other hand, switching plans may be warranted when the plans are not working as initially intended, and a new formula or method is needed to reward the right behaviors. In many cases the switching may not disrupt the perceived commitment of a firm to shared capitalism, but simply reflect experimentation to find the right approach.

To see how the shifts in programs among workplaces might work themselves out in the long run, we have applied Markov chain analysis to the 1998 to 2004 panel data. Specifically, we organized the data into transition matrices whose elements are the probabilities of moving from a given combination of practices to other combinations and, on the assumption that the transition probabilities are constant, estimated the equilibrium or steady state distribution of practices.

Table 6.3 records our results. Panel A defines the state variables simply as the number of shared capitalist pay programs at a workplace. Since there are four possible states, from zero to three programs, the transition matrix is 4 by 4. We raised the matrix to the power 2000 to obtain the steady state distribution. The columns labeled 1998 and 2004 give the proportion of workplaces with the specified numbers of programs in each year, while the column labeled equilibrium is our estimated steady state distribution. It "predicts" that the number of workplaces with two to three programs will rise while the numbers with one program will remain nearly constant, so that shared capitalism will increase gradually over time. Panel B defines the state variables as each of the combinations in our Venn diagram. Since in this case there are eight possible states, the transition matrix is 8 by 8. The calculations here tell a similar but more detailed story about change. The Markov analysis predicts a drop in the proportion of workplaces with only ESOS in contrast to the increase in that proportion from 1998 to 2004 and an increase in the proportion with ESOS and profit-related pay in contrast to the decrease in that proportion from 1998 to 2004.

Consistent with the analysis of the 2004 patterns in figure 6.1, the analysis of the panel data supports the complementarity hypothesis, with the number of workplaces having all three programs and the number expected

Table 6.3   **Markov chain analysis of equilibrium distribution of shared capitalist modes of pay**

	1998	2004	Equilibrium
A Number of shared capitalist pay schemes: esos, prp, group pbr			
0	.499	.474	.438
1	.292	.291	.287
2	.156	.155	.184
3	.053	.080	.090
B Specific combinations of pay schemes			
No shared capitalist pay	.499	.474	.444
Single systems	.292	.291	.281
ESOS only	.035	.054	.047
GRPP only	.049	.044	.040
PRP only	.208	.194	.184
Two systems	.156	.155	.190
ESOS + GRPP	.001	.010	.013
ESOS + PRP	.108	.060	.081
GRPP + PRP	.047	.085	.096
All three	.053	.080	.094

Source: Tabulated from the 1998–2004 WERS panel data file on workplaces.

Notes: Panel A; $n = 587$ private sector workplaces in WERS panel. All data are survey weighted. Last column based on analyses by James Mitchell, NIESR, for which we are grateful. Transition matrix A (in fact A' to ensure each column sums to unity) is raised to the power 2,000. Since one of A's eigenvalues is unity we have an ergodic Markov chain and the long-run forecast is thus independent of the current state. Panel B; due to rounding, the rows of the transition matrix summed to 1.0001000 so we subtracted 0.0001 to ensure that they sum to unity. GRPP = group payments-by-results; ESOS = employee share ownership schemes; PRP = profit-related pay.

to have more in the future exceeding the number that would be found if firms selected the modes of compensation independently.

6.4   Relation to Other Workplace Practices

To examine the relation between shared capitalism and other workplace policies and practices—individual payment by result, worker autonomy, and managerial monitoring of work activity, outputs, and appraisals—we use a linear regression model. The dependent variables in the regression are the measures of workplace policies and practices. The key independent variables are the forms of shared capitalist compensation.[8] The regressions hold fixed factors such as industry, size of the workplace, size of firm, and the like.

Table 6.4 presents the regression coefficients on dummy variables for employee stock ownership, group payment by results, and profit-related

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8. Models were estimated with survey-weighted OLS. Results were not sensitive to the use of probit or ordered probit estimation.

Table 6.4   Coefficients and *t*-statistics relating other pay and workplace policies to shared capitalist pay schemes

	INDPBR (1)	INDPBR (2)	Merit (3)	Merit (4)	Decision (5)	Decision (6)	Mon in (7)	Mon in (8)	Mon out (9)	Mon out (10)	Apprais (11)	Apprais (12)
GRPP	0.266		0.006		0.241		0.052		0.289		0.150	
	(6.01)**		(0.18)		(1.13)		(0.66)		(2.74)**		(1.75)	
PRP	0.075		0.089		0.486		−0.051		0.280		0.082	
	(1.91)		(2.71)**		(2.50)*		(0.74)		(2.98)**		(1.06)	
ESOS	0.011		−0.008		−0.138		−0.018		0.503		0.472	
	(0.20)		(0.20)		(0.50)		(0.21)		(3.72)**		(4.90)**	
GRPP + PRP + ESOS		0.432		0.070		0.445		−0.053		1.168		0.675
		(5.53)**		(0.98)		(1.23)		(0.39)		(6.65)**		(4.17)**
ESOS + PRP		0.077		0.124		0.306		−0.101		0.429		0.560
		(0.98)		(1.82)		(0.67)		(0.66)		(2.11)*		(3.72)**
ESOS + GRPP		0.262		0.056		0.412		0.153		1.199		0.617
		(2.31)*		(0.63)		(0.79)		(1.10)		(4.16)**		(2.91)**
ESOS only		−0.046		−0.067		−0.358		−0.170		0.496		0.673
		(0.61)		(1.38)		(0.73)		(1.34)		(2.51)*		(4.88)**
PRP + GRPP		0.242		0.074		0.814		−0.006		0.537		0.249
		(3.52)**		(1.41)		(2.45)*		(0.06)		(3.29)**		(1.76)
GRPP only		0.324		0.025		0.004		−0.057		0.035		0.273
		(4.54)**		(0.50)		(0.01)		(0.39)		(0.23)		(1.89)

PRP only	0.271	0.101	0.089		0.519		−0.044		0.333		0.168
	(1.75)	(1.96)	(1.97)*		(1.93)		(0.43)		(2.77)**		(1.60)
Constant	0.067	0.294	0.081	10.181	10.044	2.012	1.938	1.098	1.168	1.252	1.222
	(0.59)	(1.93)	(0.72)	(16.38)**	(15.81)**	(7.29)**	(6.76)**	(3.39)**	(3.65)**	(4.76)**	(4.65)**
Observations	1,680	1,684	1,684	1,680	1,684	1,680	1,684	1,680	1,684	1,680	1,684
R^2	0.22	0.23	0.09	0.20	0.19	0.08	0.08	0.30	0.31	0.28	0.28

Notes: INDPBR (0,1): individual payments-by-results. Merit (0,1): merit pay. Decision (0,12): employer perceptions of employee decision-making autonomy among employees in the workplace's largest occupational group or "core employees." The HR managers were asked: "Using the scale on this card, to what extent would you say that individuals in [Title of the largest occupational group] here have variety in their work, discretion over how they do their work, control over the pace at which they work, involvement in decisions over how their work is organized?" The scale on the card was "a lot, some, a little, none." An additive scale was created running from 0 ("none" on all four items) to 12 ("a lot" on all four items). Mon in (0, 4): additive scale for the monitoring of worker inputs, the workplace scoring a point when the quality of employees' work is monitored by supervisors, if some/all supervisors can dismiss employees for unsatisfactory performance, where 20 percent + of employees are supervisors. A point is deducted if employees monitor the quality of their own work (co-monitoring). Finally a point is added to the scores so they range from 0, 4 rather than −1, 3. Mon out (0, 4): additive scale for monitoring outputs scoring a point when the quality of output is monitored through inspectors located elsewhere, through customer surveys, records of faults/complaints are kept, and there are targets for productivity and records kept. Apprais (0, 3): additive scale for appraisal systems scoring a point when all nonmanagerial staff are appraised, appraisals occur half-yearly or quarterly, and non-managerial pay is linked to performance appraisal. All models contain following controls: firm size (three dummies); single-workplace organization (single dummy); industry (twelve dummies); foreign owned (single dummy); workplace aged 25+ year (single dummy); recognizes union for pay bargaining (two dummies); largest occupational group (eight dummies); has many competitors (single dummy); product market is growing (single dummy). In addition, the INDPBR models contain controls for monitoring inputs, outputs, appraisal, and decision making; the decision-making models contain controls for monitoring inputs and outputs and appraisals; and the monitoring and appraisal models contain controls for decision making.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

pay; and on dummy variables for the seven independent categories in the Venn diagram.

The dependent variable in columns (1) and (2) is a dichotomous measure of whether workers receive individual payment by results (see appendix). The estimated coefficients show that individual pay by results is more likely in the presence of shared capitalist pay than otherwise. In column (1) the biggest effects occur for group payment by results, indicating that these two forms of compensation are very closely linked. In column (2) the largest coefficient occurs when workplaces have all three forms of shared capitalist pay. These results suggest that, as argued, individual and group payment for results are complements, though we have no reliable way with the WERS data to determine whether firms with the two modes of pay are in fact choosing the optimal levels.

The dependent variable in columns (3) and (4) is merit pay, which is based on a subjective assessment of individual performance by a supervisor or manager. Again, there are indications of a positive association with share capitalism, but in this case it is confined to an association with profit-related pay.

Columns (5) and (6) measure employee autonomy in decision making as reported by human resource managers in response to a question regarding "the extent to which you would say that individuals in the largest occupational group: have variety in their work, discretion over how they do their work, control over the pace at which they work, involvement in decisions over how their work is organized?" The responses have a four-point scale ("a lot, some, a little, none"), from which we formed a summated rating that went from 0 ("none" on all four items) to 12 ("a lot" on all four items).[9] Ten percent of workplaces scored less than 5 on this scale, 47 percent scored 5 to 8, and 44 percent scored 9 or more.

The regression coefficients show modestly greater autonomy for worker decision making in the presence of shared capitalist pay than otherwise, with the primary impact coming through profit-related pay in column (5) and the combination of profit-related pay and group payment for results in column (6). While it is dangerous to compare results from different surveys across countries, the link between shared capitalist pay and employee decision making seems weaker in the United Kingdom than in the United States.[10]

The dependent variable in columns (7) and (8) measures the extent of managerial monitoring of worker *inputs*. It is based on responses to questions about whether workplaces used managers or supervisors to monitor

9. Factor analysis of these items produces a single factor with an eigenvalue of 2.21 and a Cronbach alpha of 0.73, suggesting that the items are aspects of a single construct.

10. As an alternative measure, we also examined employee responses to an analogous question: "In general, how much influence do you have over the following. . . . What tasks you do in your job, the pace at which you work, how you do your work, the order in which you carry out tasks, the time you start or finish your working day?" with responses coded using an additive scale comparable to that used for employers. Because there were five questions the scale ran from (0 to 15). This variable was unrelated to shared capitalist modes of pay.

the quality of work, whether supervisors have the power to dismiss workers, and whether workplaces have a high percentage (20 percent +) of supervisors among their employees, and on whether the firm reports that employees monitor the quality of their own output (in which case a point is deducted from this scale). This variable is scaled from 0 to 4 (see footnote to the table for details). The regression coefficients show that shared capitalism is not significantly associated with managerial monitoring of worker inputs.

The dependent variable in columns (9) and (10) is a measure of employer monitoring of *outputs.* It is based on questions regarding the use of inspectors in separate departments, customer surveys, keeping records of faults and complaints, and the use of records to monitor labor productivity targets. This variable is scaled from 0 to 4. The regression coefficients show that shared capitalist pay is strongly associated with more managerial monitoring of outputs, with employee share schemes having the largest impact in column (9) and the presence of all three schemes or the combination of share schemes and group payments-by-results having the largest impact in column (10).

Finally, columns (11) and (12) examine the relation between employer use of appraisal systems of how workers are doing and shared capitalist pay. The measure of appraisal is an additive scale based on whether the firm appraises all nonmanagerial staff, if appraisals occur half-yearly or quarterly, and if nonmanagerial pay is linked to performance appraisal. This variable is scaled from 0 to 3. The positive regression coefficient on the share ownership dummy variable in column (11) shows that workplaces with shared ownership modes of pay do more appraisal of employees than other workplaces. In column (12) the message is similar, with large coefficients on the interaction relating to workplaces that have stock ownership and on the coefficient on the "only share ownership" dummy variable.

The associations between shared capitalist compensation and the other policies and practices shown in these regressions do not tell us how management coordinates the various pay schemes to form a coherent working environment, but they do support the notion that shared capitalist arrangements work best in conjunction with other innovations in the employment relationship consistent with the model we sketched out earlier.

6.5   Basic Productivity Relations

"Share ownership offers employees a real stake in their company . . . encourage(s) the new enterprise culture of team work in which everyone contributes and everyone benefits from success. . . . Employee share ownership has a contribution to make towards increasing Britain's productivity." (HM Treasury 1998, 1–2)

To see how shared capitalist modes of pay affect productivity we estimate production functions. We have three measures of productivity. The first mea-

sure is an index based on the responses of human resource managers to the question: "Compared with other establishments in the same industry how would you assess your workplace's labor productivity?" Responses are ordered in a five-point scale from "a lot better than average" to "a lot below average". Of the 1,512 human resource managers who answered this question in the 2004 WERS, 6 percent thought their workplace's productivity was either "below" or "a lot below average"[11], 42 percent thought it was "average", 42 percent thought it was "better than average," and 10 percent described it as "a lot above average." Most British studies of the effect of modes of compensation on productivity have used questions of this form in their analyses.[12]

We supplement this measure with two accounting measures collected in the 2004 WERS by a Financial Performance Questionnaire (FPQ): gross output per worker (the ratio of total value of sales of goods and services over the past year to total employment); and gross value added per worker (the ratio of total sales minus the total value of purchases of goods, materials, and services divided by total employment).[13] These measures are correlated with one another at 0.39. But they are not correlated with manager reports of productivity relative to the industry average, suggesting that the financial performance questionnaire and human resource manager reports on productivity contain different information about the workplace.

Given these three measures, our first inclination was to give more weight to the accounting measures in our productivity analysis. The accounting measures underlie standard production function regressions and are more objective than the management reports. But we quickly learned that the accounting measures have problems. Only 47 percent of workplaces participating in WERS responded to the financial performance questions, and some responses were such large outliers that we dropped them from the analysis.[14] After trimming the top and bottom 2.5 percent of values, we had valid data for 586 workplaces for productivity measured as sales per employee and for 524 workplaces for productivity measured as value added per employee.[15] This reduced our sample by about 60 percent. We will give roughly equal weight to the three estimates in our assessment of the effects of shared capitalism on productivity.

Table 6.5 gives the coefficients for the association between the three mea-

11. We collapsed the responses "a lot below" and "below average" into a single category due to the small number of responses in that part of the distribution.

12. Kersley et al. (2006, 287–89) compare alternative productivity measures.

13. The FPQ questionnaire is: www.wers2004.info/wers2004/crosssection.php#fpq. Chaplin et al. (2005) describe the data and administration of the questionnaire.

14. Most of the data relate to an accounting period ending in 2004, with some data relating to a period ending in 2003. Where data did not relate to a full calendar year we adjusted accordingly.

15. The estimation samples are a little lower because we dropped a few observations with missing dependent variables.

Table 6.5   **Coefficients and *t*-statistics relating manager reports of productivity, Ln sales/employee and Ln value added/employee to shared capitalist pay schemes**

	Management view of lab prod (1)	Management View of lab prod (2)	Ln sales/ Em (3)	Ln Sales/ Em (4)	Ln VA/ emp (5)	Ln VA/ emp (6)
GRPP	0.042	0.031	0.001	0.005	0.001	–0.000
	(0.34)	(0.25)	(0.01)	(0.04)	(0.06)	(0.03)
PRP	0.113		–0.040		–0.003	
	(1.09)		(0.33)		(0.31)	
ESOS	0.305		0.436		0.033	
	(2.28)*		(2.90)**		(2.75)**	
PRP (ref: none)						
1–99% covered		–0.149		0.033		0.026
		(0.81)		(0.18)		(1.96)
100% covered		0.269		–0.284		–0.015
		(2.09)*		(1.63)		(1.78)
ESOS (ref: none)						
Managers only		0.180		0.475		–0.001
		(0.95)		(2.05)*		(0.05)
1–99% nonmanagers covered		0.032		0.274		0.009
		(0.11)		(1.43)		(0.47)
100% nonmanagers covered		0.356		0.513		0.045
		(2.36)*		(2.96)**		(3.24)**
Cut 1:Constant	–0.960	–0.983				
	(2.48)*	(2.56)*				
Cut 2:Constant	0.702	0.687				
	(1.77)	(1.75)				
Cut 3:Constant	2.196	2.189				
	(5.43)**	(5.45)**				
Constant			4.523	4.546	6.553	6.551
			(13.93)**	(14.14)**	(227.88)**	(240.53)**
Observations	1,487	1,486	577	577	517	517
R^2			0.54	0.55	0.34	0.37

Notes: Control variables are as per table 6.4 except that the monitoring and appraisal variables were entered separately rather than additive scales and individual PBR and merit pay are included as controls.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

sures of productivity and the incidence and intensity of shared capitalist pay in terms of the proportion of workers covered. All models are run with sampling weights that are the inverse of the probability of sample selection. The weights for the models that use the financial performance questionnaire data also adjust for nonresponse, as described in Chaplin et al. (2005). We use a robust estimator to account for heteroskedasticity. The coefficients in models (1) and (2) are from ordered probits for the subjective measure of

labor productivity relative to the industry average. The coefficients in models (3) and (4) and in models (5) and (6) are from linear regression models for log sales per employee and log value added per employee, respectively.

The odd-numbered columns give the results for the incidence of shared capitalist forms of pay. They show share ownership schemes are positively associated with labor productivity on all three productivity measures while neither profit-related pay nor group pay for performance have any noticeable relation to productivity. The even-numbered columns give the results when the measure of shared capitalist pay considers the coverage of the pay system—whether it includes all workers or just management and perhaps a select few others. They show that the stock ownership schemes that enlist all employees raise productivity by all three of our measures, while schemes targeted at managers only are positively associated with sales per employee. Again, the other forms of shared capitalism have little relation to the measures of productivity.

6.6   Complementarity in Production

For our production function test of the complementarity of shared capitalist forms of pay, we regressed each of our measures of productivity on dummy variables for the seven independent categories in the Venn diagram. The calculations in table 6.6 summarize the results. There is evidence for complementarity in the effects with each of the measures of productivity, but the particular mixture of pay systems that have the largest impact on productivity differs among the productivity measures.

In the regression for managers' perception of productivity the biggest impacts occur when workplaces have all three forms of pay, or have employee share ownership and profit-related pay or employee ownership and group payments-by-results. This indicates that the positive impact of share ownership found in table 6.5 occurs when share ownership is combined with profit-related pay or group payments-by-results.

By contrast, in the regression in which productivity is measured by sales per worker, the biggest impacts on productivity occur when workplaces have employee share ownership and profit-related pay or employee ownership and group pay for results. Having share ownership by itself does better than having all the schemes together.

The interactions are weakest in the value added regression, with the biggest impacts occurring when workplaces combine employee share ownership with group pay for results followed by combining it with profit-related pay.

Finally, if we simplify the regressions by replacing the share ownership interactions with a single dummy identifying share ownership in combination with group payments-by-results and/or profit-related pay, the dummy is positive and significant for all three productivity measures, confirming that

Table 6.6 **Coefficients and t-statistics for the effects of complementarity among shared capitalist pay and other workplace arrangements on managers' reports of productivity (labrod), Ln sales/employee (lnte) and Ln value added/employee (lngvae)**

	labprod (1)	lnte (2)	lngvae (3)
ESOS + PRP + GRPP	0.505	0.119	0.011
	(2.51)*	(0.46)	(0.57)
ESOS + PRP	0.550	0.647	0.041
	(2.55)*	(2.89)**	(1.77)
ESOS + GRPP	0.480	0.782	0.082
	(1.93)	(2.36)*	(2.38)*
PRP + GRPP	–0.020	0.034	0.002
	(0.10)	(0.19)	(0.20)
ESOS only	0.067	0.301	0.004
	(0.32)	(1.94)	(0.27)
GRPP only	0.212	0.063	–0.018
	(1.14)	(0.30)	(1.56)
PRP only	0.208	–0.003	–0.010
	(1.47)	(0.02)	(1.03)
Cut 1:Constant	–0.919		
	(2.42)*		
Cut 2:Constant	0.750		
	(1.93)		
Cut 3:Constant	2.257		
	(5.70)**		
Constant		4.525	6.552
		(14.19)**	(235.41)**
Observations	1,490	578	518
R^2		0.55	0.36

Note: controls are as per table 6.5.

***Significant at the 1 percent level.

**Significant at the 5 percent level.

*Significant at the 10 percent level.

combinations of shared capitalism systems that include share ownership are positively correlated with productivity, however we measure it.[16]

6.7   Comparison with Prior Literature and Oxera-Treasury

Our production function study follows a long line of UK analyses of the effects of shared capitalism. Many analysts have used earlier waves of

16. The coefficients and *t*-statistics for share capitalist bundles incorporating share ownership are 0.492 (2.96) for managers' assessments of productivity, 0.444 (2.12) for sales per employee, and 0.035 (2.10) for value added per employee.

the WERS to examine the effects of various forms of shared capitalism on manager reports of financial outcomes or labor productivity. Some have used surveys of particular sectors with quantitative measures of productivity such as sales or value added, often within the order of 100 firms. Bryson and Freeman (2007) and Oxera in its analysis for the UK Treasury (Oxera 2007a, appendix 2) summarize this work. The two reviews show that the majority of studies find positive effects of shared capitalist pay on productivity or financial outcomes, while some find negligible effects, and virtually none find negative effects.[17] They also find that the pay schemes that have positive effects vary across studies and sometimes within the same study depending on the measure of outcomes or data under analysis.

After we completed our research, the Treasury released a study that comes as close as we could imagine to giving a definitive analysis of the effects of tax-advantaged modes of shared capitalism on productivity. This study has the largest sample of any done in the United Kingdom—16,844 firms—obtained by matching HM Revenue and Customs' administrative data on Approved Profit Sharing systems, SAYE systems, and CSOP systems to measures of productivity based on sales from the Financial Analysis Made Easy (FAME) data set. In addition, the Oxera-Treasury study obtained measures of productivity for 7,633 companies based on value added from the Annual Respondents Database (ARD) provided by the Office of National Statistics. The Oxera-Treasury study covered enough years and firms to permit a panel analysis with fixed effects as well as cross section comparisons of firms with and without particular schemes.

The results of the Oxera-Treasury study confirm the finding in our study and in the bulk of the earlier literature that shared capitalism raises productivity. When the study measures output by sales "on average, across the whole sample, the effect of tax-advantaged share schemes is significant and increases productivity by 2.5% in the long run" (Oxera 2007a, 3). It also finds important complementarities in the effects that are consistent with our results: "there are further benefits to be gained from operating several types of schemes," with gains accruing primarily to companies that have both tax advantaged and not tax-advantaged schemes; and with large gains for the SAYE share ownership scheme.

With its large sample size and use of panel data as well as cross section data, the Oxera-Treasury analysis has arguably generated the strongest findings thus far on the effects of shared capitalism in the United Kingdom. Surprisingly perhaps given the sample size, the Oxera-Treasury study reports variation in results that resemble those in our study and others using smaller data sets: lower estimated productivity gains when output is measured with

17. A count of the studies in the Oxera report shows that ten of the thirteen that estimated the effects of profit sharing found that it was associated with higher productivity while seven of the ten studies that examined share ownership found that it was associated with higher productivity.

value added than with sales; different estimated effects across sectors; and different estimates of which schemes matter most when output is measured in value added than when output is measured in sales. The study notes that it lacks information on coverage of schemes or on other business practices of firms (as in the WERS) that could cast additional light on the impacts of the schemes.

6.8 Conclusion

In sum, shared capitalism has grown in the United Kingdom, as it has in the United States; firms use various forms of shared capitalist pay together and often accompany them with other labor practices, consistent with the complementary hypothesis. But firms switch among schemes frequently, which suggests that they have trouble optimizing and that the transactions cost of switching are relatively low. Among the single schemes, share ownership has the clearest positive association with productivity, but its impact is largest when firms combine it with other forms of shared capitalist pay. Given that even the large sample Oxera-Treasury study finds sizable variation across groups, schemes, and measures of productivity, additional studies using administrative data or the richer but smaller WERS files are unlikely to greatly advance our knowledge of what makes shared capitalism work in the United Kingdom. To advance our knowledge further would seem to require studies that focus specifically on shared capitalist firms, such as the NBER data set fourteen-firm study used in other chapters of this book, with questions and case analyses directed at particular hypotheses about the detailed operation of shared capitalist programs in corporations.

Appendix

Survey Questions Used to Derive Share Capitalism Variables

The share capitalism measures are derived from the following survey questions.

Payments-by-Results (PBR)

"Do any of the employees in this establishment get paid by results or receive merit pay? On this card is an explanation of what we mean by payment-by-results and merit pay."
Card reads:

1. Payment-by-results
"Payment-by-results" includes any method of payment where the pay is determined by the amount done or its value, rather than just the number of

hours worked. It includes commission, and bonuses that are determined by individual, establishment, or organization productivity or performance. It does not include profit-related pay schemes.

2. Merit pay

"Merit pay" is related to a subjective assessment of individual performance by a supervisor or manager.

Follow-up questions establish the occupations covered by PBR and the percentage of nonmanagerial employees covered. In addition, the following question establishes whether PBR is calculated at individual, group, or organization level:

"Thinking just about payment by results, what / What) measures of performance are used to determine the amount that employees receive?"
PROBE: Which others? UNTIL "None".
1. Individual performance/output
2. Group or team performance/output
3. Workplace-based measures
4. Organization-based measures
5. Other measures

Profit-Related Pay

"Do any employees at this workplace receive profit-related payments or profit-related bonuses?"

Follow-up questions establish the occupations covered by PRP, the percentage of nonmanagerial employees covered, and the percentage in receipt of PRP payments. In addition, the following question establishes the organizational level at which PRP is calculated if the workplace is part of a larger organization:

"For what part of your organization is the amount of profit-related pay calculated. . . . Workplace, Division/Subsidiary company, Organization as a whole?"

Share Schemes

"Does this company operate any of the employee share schemes listed on this card for any of the employees at this workplace?"
PROBE: Which others? UNTIL "None."
1. Share Incentive Plan (SIP)
2. Save As You Earn (SAYE or Sharesave)
3. Enterprise Management Incentives (EMI)
4. Company Share Option Plan (CSOP)
5. Other employee share scheme
6. None of these

Card reads:

1. Share Incentive Plan (SIP)—a tax and NIC advantaged plan where employees can purchase shares and companies can give employees free shares or matching shares.

2. Save As You Earn (SAYE or Sharesave) share options scheme—tax advantaged scheme where employees save to purchase their employer's shares.

3. Enterprise Management Incentives (EMI)—where smaller companies can grant up to a total of £3 million of tax and National Insurance Contributions (NIC) advantaged share options to their employees.

4. Company Share Option Plan (CSOP)—where companies can grant each of their employees up to £30,000 of tax and NIC advantaged share options.

5. Other employee share scheme.

Subsequent questions identify the occupations eligible for share ownership schemes and the percentage participating in schemes.

Recent Introduction of Performance-Related Pay

Over the past two years has management here introduced any of the changes listed on this card?
PROBE: Which others? UNTIL "None".
1. Introduction of performance-related pay
2. Introduction or upgrading of computers
3. Introduction or upgrading of other types of new technology
4. Changes in working time arrangements
5. Changes in the organization of work
6. Changes in work techniques or procedures
7. Introduction of initiatives to involve employees
8. Introduction of technologically new or significantly improved product or service
9. None of these

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