

Employee Share Ownership, Employee Voice and Labour Productivity: Evidence on the Complementarities Thesis.

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INTRODUCTION

Employee share ownership plans (ESO) have a significant and growing presence in a number of countries throughout Europe, the United States and Australia. The main appeal of these plans to policy makers has been their potential impact on company productivity. Yet the empirical literature has not provided compelling evidence that ESO is associated with higher productivity (Blasi et al 1996), though the observed effects are usually positive, albeit often small (Perotin and Robinson 2003). It has been widely argued that stock plans have larger positive effects when operated in conjunction with policies that overcome free-rider effects, such as employee involvement in decisions (Weitzman and Kruse 1990).

There is also an alternative, though less commonly asserted, claim in the literature. This is that 'too much' employee involvement has adverse effects on productivity because involving ill-qualified participants affects the quality and speed of decision-making. It also potentially introduces diverse and potentially conflicting interests into the management process. The conjunction of ESO and employee involvement in decisions could be a 'toxic combination' because employee owners may assert stronger rights to influence decisions than is efficient (Hansmann 1996; Pendleton 2001).

The starting point is that none of these competing claims is likely to be universally correct. The independent and combined effects of ESO plans and employee involvement will be influenced by the overall level of ESO, the extent of employee participation in the stock plan, and the extent and 'quality' of employee involvement. Innovatively, we use visual representations to show how the sign, size, and significance of the relationship between ESO participation varies with the extent and quality of employee involvement. This 'richer' analysis of the complementarities thesis provides an intriguing challenge to the prevailing orthodoxy in the literature to date.

Background

The theoretical basis for the complementarity between employee share ownership and employee involvement is rooted in principal-agent perspectives. If employees' remuneration is to be aligned with principals' desired outcomes, it makes sense to let employees influence how work is performed, especially if employees asymmetrically possess production-relevant information. Equally, employees may require a pay-off for sharing information and cooperating with managers and their peers (Ben-Ner and Jones 1995).

A further reason for anticipating complementarity between share ownership plans and employee involvement is the free rider or '1/N problem'; as the size of the performance unit (N) grows the link between an individual's effort and reward becomes more tenuous and the incentive to shirk or free-ride more tempting. The literature has typically resolved this contradiction by pointing to the role of employee involvement. This provides the setting for 'repeated games' whereby employees will come to see that cooperation and high levels of personal performance will pay-off in stock plan outcomes (Weitzman and Kruse 1990). It also provides an institutional setting for peer pressure and 'mutual monitoring' (Blasi et al 2006), and may help to develop a culture which deters 'shirking'.

Employee involvement in decisions is therefore integral to the agency-based case that stock ownership plans can enhance productivity. How much evidence is there to support this contention? The short answer is not much. Empirical support for complementarity tends to be either absent, weak, or inconsistent (see reviews in Blasi et al 1996; Perotin and Robinson 2003).

There are two alternatives to the notion of complementarity between stock plans and other forms of involvement. One is that complementarity is unnecessary: stock plans work independently of involvement, as is suggested by some of the empirical evidence (Canyon and Freeman 2004). The explanation might be that free rider effects are not as damaging as agency theory implies because

stock plans affect productivity in other ways than those assumed in the incentives literature. A growing literature has indicated that their contribution to human capital may be important, either through sorting (Lazear 2000), alignment of remuneration with the state of the labour market (Oyer 2004), or support for employer-provided training (Robinson and Zhang 2005).

A second is that involvement in decisions detracts from the productivity effects of stock ownership plans. Potential costs include the entry of inexperienced or unqualified personnel to decision-making, delays to decision-making, and the difficulties of reconciling competing employee interests (Hansmann 1996). These costs might be amplified where there are stock ownership plans. Employees involved in involvement arrangements may claim rights to challenge management decisions based on part-ownership, and this may further impede managerial decision-making (see Pendleton 2001).

Based on the preceding discussion, several predictions are advanced. One, stock ownership plans have independent effects on productivity but these are more likely to be observed or will be larger when employee membership of the plan is high. Two, where employee participation rates are low, the independent effects of stock plans will be muted, and further forms of employee involvement will be necessary to achieve favourable productivity effects. Three, employee involvement can detract from the independent effects of stock plans when participation rates are high because a strong ownership culture may lead employees to exert more influence over decisions than is efficient.

Data and Model Specification

The data source is the British Workplace Employment Relations Survey (WERS) 2004. This is a nationally representative survey of British workplaces and comprises extensive information on a wide range of labour management practices including employee share ownership and employee involvement schemes as well as performance data. Our analysis is based on estimating various specifications of the following ordered probit model:

$$\text{Labour Productivity} = \beta_1(\text{ESO}) + \beta_2(\text{EP}) + \beta_3(\text{ESO} \times \text{EP}) + \beta_4(\text{Controls}) + \beta_5(\text{Intercepts}) \quad (1)$$

where labour productivity is measured on a five point ordered scale capturing the relative productivity of the establishment compared to other firms in the same industry. Employee share ownership is measured in two ways. Our broadest measure of ESO (*plan presence*) deals with the availability of a plan according to whether any non-managerial employee is eligible to join a scheme. Our second measure (*plan coverage*) records the level of employee participation in ESO schemes according to whether a majority (60 per cent or more) of non-managerial employees participate in the scheme (ESOMAJ) or 'minority' participation prevails (less than 60 per cent participation - ESOMIN).

Our analysis also uses two different measures of employee involvement in order to capture the depth and quality of involvement. The first measure (*involvement practices*) records the number of direct involvement arrangements in each workplace - quality circles, meetings, briefings, suggestion schemes, and so on, ranging from 0 to a maximum of 10. Our second measure (*employee voice*) attempts to measure the 'quality' of involvement by indicating the extent to which involvement provides an effective voice for employees. It utilizes the questions in WERS asking about the amount of time devoted to employee questions and views in workplace meetings and team briefings. To create involvement scales from these variables, we use the CATPCA data reduction technique to transform the qualitative values which underpin these concepts into quantitative ones.

To facilitate the graphical representation of the interactions terms and overcome well documented problems with the estimation and interpretation of conditional effects in non-linear models (Hoetker 2007; Ai and Norton 2003) we adapt the simulation methodology of Brambor, Clark and Golder (2008) to the case of an ordered dependent variable. This allows us to convert the estimated coefficients and variance-covariance matrix of the ordered probit model into estimates of the probability of reporting each level of labour productivity for different values of stock ownership and employee involvement. From this we can calculate the marginal effect of the interaction term and associated measures of uncertainty (95% confidence intervals) for each category of the dependent variable. We then graph each effect to show the changing impact of stock plans on labour productivity as the degree of employee involvement changes. In order to test whether our predictions hold generally for all stock

plans, the procedure is first used with our broadest measure of employee stock ownership (*ESO presence*) and repeated twice, once for each of our measures of employee involvement. This approach is then repeated with the measures of *ESO coverage*.

Results

As a first step we report a number of baseline models (models 1-3) of labour productivity in which we estimate the independent effects of ESO and employee involvement for our two measures of share ownership - *ESO Presence* (Table 1) and *ESO Coverage* (Table 2). Across all specifications it is evident that ESO has a positive, independent and statistically significant effect on labour productivity with the ESO coverage measures indicating that these effects are driven by the level of worker participation in the schemes. Calculation of marginal effects indicates that the incidence of ESO increases the probability of reporting 'a lot better than average labour productivity' by 8.3 per cent, with this increasing to 11.4 per cent where a majority of employees participate in the scheme. Positive independent effects are also apparent for our 'involvement practices' measure of employee involvement albeit at the 10 per cent level of significance but not where our measure gauges the 'quality' of this involvement.

As with previous analysis of this type, an initial review of our interaction models (see model 4) indicates limited and conflicting evidence of any joint effect of ESO and involvement on labour productivity. However it is difficult to deduce anything with any certainty when the analysis is presented in this way. Applying the simulation methodology to the properties of these models provides compelling evidence of the need to analyze and interpret interaction effects correctly. In contrast to the reported coefficients and significance levels in Tables 1 and 2, the graphical representation of the interaction terms in Figures 1 and 2 reveal a host of statistically significant findings that provide a richer and fuller picture of how, when, and to what extent the impact of ESO on labour productivity is affected by changes in the amount of involvement. In all instances, positive, statistically significant interaction effects are revealed, but the size, direction and significance of these effects vary over the range of the involvement measure and according to the measure of ESO and involvement under consideration.

The results provide support for all three predictions. The findings show the positive, statistically significant joint effects of ESO and employee involvement on labour productivity, at least for some of the range of values for involvement. This effect is evident in all cases and is revealed where both confidence intervals (dashed lines) are positive and above zero. The graphs also reveal the persistence of independent ESO effects (where there are no direct involvement schemes or where employee voice is 'zero') but only when there is high ESO coverage. Finally, while the graphs reveal no evidence of a statistically significant negative interaction effect (where both confidence intervals are non-positive and below zero), they indicate that the size of the ESO effect diminishes as the extent of employee voice increases, especially when there is majority participation in the ESO plan.

Conclusions

Our results have both methodological and conceptual implications. Methodologically, graphical representations of the effects of interaction terms provide a more nuanced but also clearer picture of posited complementarities than can be obtained by reliance on coefficients. It is clear too that the measurement of key phenomena affects empirical findings. Where ESO and involvement are recorded in a fairly simplistic way (presence), the findings support the notion of synergy found in the literature. However, higher quality measures provide a rather different picture. These findings reinforce recent comments in the literature on high performance work practices that more sophisticated measures than mere presence of practices and institutions are desirable (e.g. Cox et al 2006).

The results question the prevailing view in the literature that involvement is necessary to overcome free-rider problems. Our results reveal that ESO can have independent effects on productivity. This is less surprising than might first be apparent. Where an explicit decision to participate is required by employees, many of those making this decision will 'buy into' the plan. We suspect that the centrality granted to free-rider effects in much of the literature is an extrapolation from the highly specific case of ESOPs (where employees 'passively' receive 'shares') to employee share plans more generally.

Table 1
Labour Productivity and Employee Stock Ownership Presence:
The Conditioning Effects of Involvement Practices and Employee Voice.

ES0 Presence									
Involvement Practices					Employee Voice				
Model	1	2	3	4	Model	1	2	3	4
Variables	Independent Effects ESO only <i>Coefficient</i>	Independent Effects IP only <i>Coefficient</i>	Independent Effects ESO & IP <i>Coefficient</i>	Interaction Model <i>Coefficient</i>	Variables	Independent Effects ESO only <i>Coefficient</i>	Independent Effects EV only <i>Coefficient</i>	Independent Effects ESO & EV <i>Coefficient</i>	Interaction Model <i>Coefficient</i>
<i>ES0</i>	0.4532** (0.1814)		0.4172** (0.1803)	0.1476 (0.5485)	<i>ES0</i>	0.4398** (0.1826)		0.4412** (0.1821)	0.4957* (0.2676)
<i>Involvement Practices</i>		0.0609** (0.0283)	0.0535* (0.0286)	0.0465 (0.0297)	<i>Employee Voice</i>		0.0273 (0.0606)	0.0294 (0.0607)	0.0390 (0.0685)
<i>ES0 x Involvement Practices</i>				0.0440 (0.0756)	<i>ES0 x Employee Voice</i>				-0.0496 (0.1381)
<i>Controls^d</i>	Yes	Yes	Yes	Yes	<i>Controls^d</i>	Yes	Yes	Yes	Yes
<i>Cut1/</i>	-2.45***	-2.23***	-2.27***	-2.31***	<i>Cut1/</i>	-2.45***	-2.38***	-2.39***	-2.37***
<i>Cut2/</i>	-1.33***	-1.09***	-1.14***	-1.17***	<i>Cut2/</i>	-1.32***	-1.24***	-1.27***	-1.25***
<i>Cut3/</i>	0.17	0.41*	0.36	0.34	<i>Cut3/</i>	0.17	0.24	0.23	0.24
<i>Cut4/</i>	1.61***	1.85***	1.82***	1.79***	<i>Cut4/</i>	1.61***	1.67***	1.67***	1.69***
F	2.82***	2.83***	3.05***	2.93***	F	2.88***	2.65***	2.85***	2.72***
N	1086	1086	1086	1086	N	1078	1078	1078	1078

***, **, * statistically significant at the 1%, 5% and 10% level respectively

Standard errors in parenthesis.

^a In addition to these variables the following baseline model (see table 1) was included in all estimations: trade union recognition, occupational composition of workforce, product market competition, workforce training, workplace size, establishment size, industry controls.

Estimates based on survey ordered probit using weighted data

Table 2
Labour Productivity and Employee Stock Ownership Coverage:
The Conditioning Effects of Involvement Practices and Employee Voice.

ESO Coverage									
Participatory Practices					Employee Voice				
Model	1	2	3	4	Model	1	2	3	4
Variables	Independent Effects ESO only <i>Coefficient</i>	Independent Effects IP only <i>Coefficient</i>	Independent Effects ESO & IP <i>Coefficient</i>	Interaction Model <i>Coefficient</i>	Variables	Independent Effects ESO only <i>Coefficient</i>	Independent Effects EV only <i>Coefficient</i>	Independent Effects ESO & EV <i>Coefficient</i>	Interaction Model <i>Coefficient</i>
<i>ESOMAJ</i>	0.5575** (0.2277)		0.5416** (0.2255)	1.2271** (0.5582)	<i>ESOMAJ</i>	0.5472** (0.2256)		0.5471** (0.2270)	0.9610*** (0.2958)
<i>ESOMIN</i>	0.2411 (0.2554)		0.1950 (0.2555)	-1.3824 (1.0606)	<i>ESOMIN</i>	0.2380 (0.2560)		0.2419 (0.2542)	-0.1373 (0.3566)
<i>Involvement Practices</i>		0.0565** (0.0283)	0.0533* (0.0289)	0.0472** (0.0299)	<i>Employee Voice</i>		0.0353 (0.0614)	0.0360 (0.0616)	0.0399 (0.0564)
<i>ESOMAJ x Involvement Practices</i>				-0.1012 (0.0787)	<i>ESOMAJ x Employee Voice</i>				-0.3308** (0.1633)
<i>ESOMIN x Involvement Practices</i>				0.2431* (0.1465)	<i>ESOMIN x Employee Voice</i>				0.3745* (0.2136)
<i>Controls^a</i>	Yes	Yes	Yes	Yes	<i>Controls^a</i>	Yes	Yes	Yes	Yes
<i>Cut1/</i>	-2.44***	-2.22***	-2.27***	-2.38***	<i>Cut1/</i>	-2.44***	-2.34***	-2.37***	-2.41***
<i>Cut2/</i>	-1.31***	-1.08***	-1.12***	-1.16***	<i>Cut2/</i>	-1.30***	-1.20***	-1.23***	-1.24***
<i>Cut3/</i>	0.19	0.42*	0.38	0.35	<i>Cut3/</i>	0.19	0.28	0.26	0.27
<i>Cut4/</i>	1.62***	1.85***	1.83***	1.80***	<i>Cut4/</i>	1.63***	1.70***	1.70***	1.72***
F	2.66***	2.74***	2.85***	2.76***	F	2.77***	2.62***	2.75***	2.80***
N	1036	1036	1036	1036	N	1029	1029	1029	1029

***, **, * statistically significant at the 1%, 5% and 10% level respectively

Standard errors in parenthesis.

^a In addition to these variables the following baseline model (see table 1) was included in all estimations: trade union recognition, occupational composition of workforce, product market competition, workforce training, workplace size, establishment size, industry controls.

Estimates based on survey ordered probit using weighted data

Figure 1: ESO Presence-Employee Involvement Marginal Effects

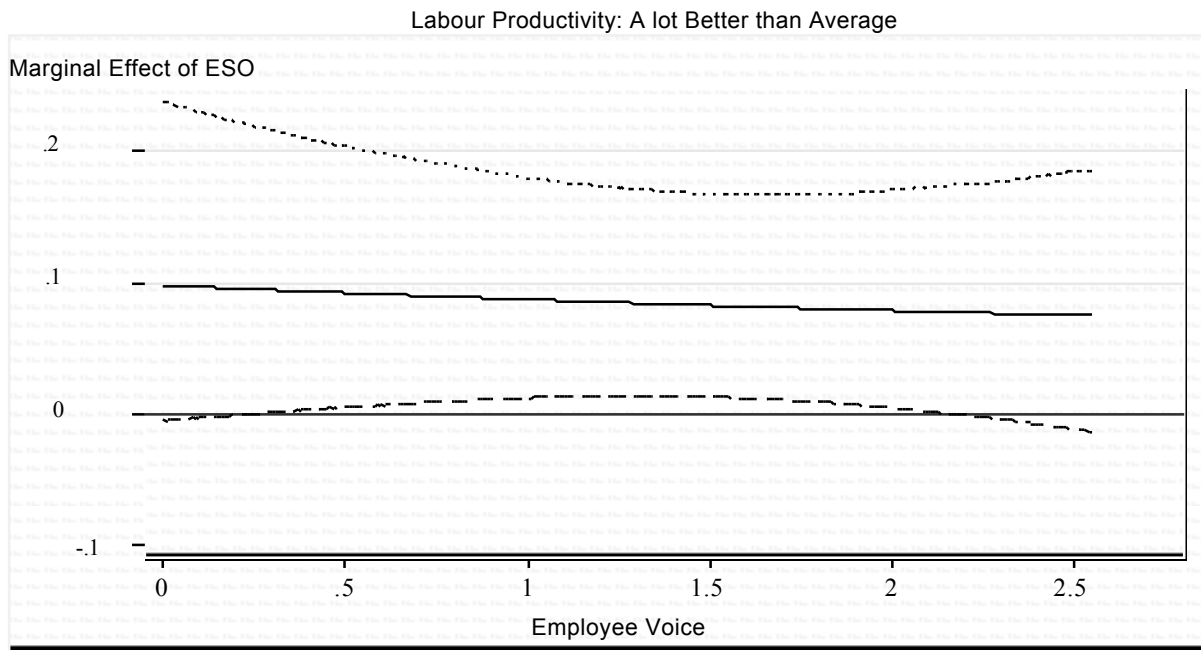
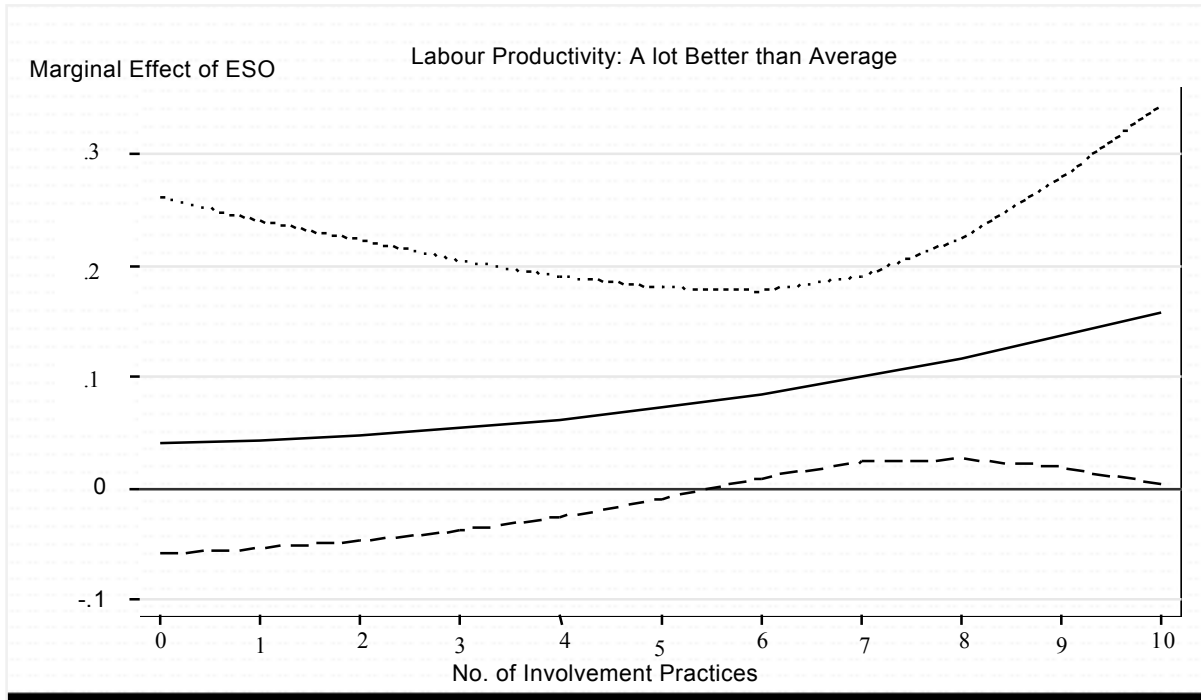


Figure 2: ESO Coverage-Employee Involvement Marginal Effects

ESO Minority: <60% OF EMPLOYEES PARTICIPATE IN THE SCHEME

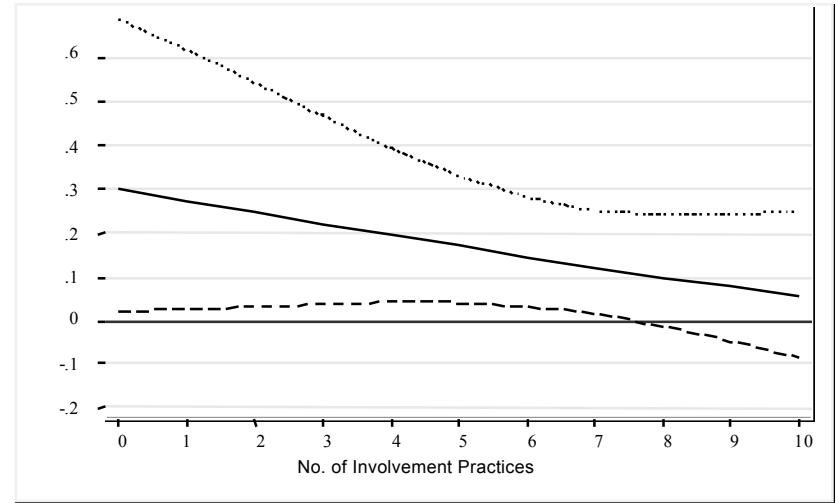
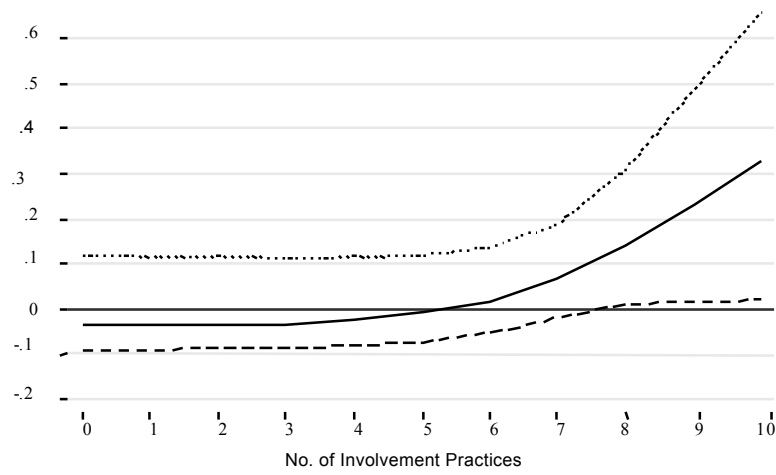
ESO Majority: ≥ 60% OF EMPLOYEES PARTICIPATE IN THE SCHEME

Labour Productivity: A lot Better than Average

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Marginal Effect of ESO

Marginal Effect of ESO

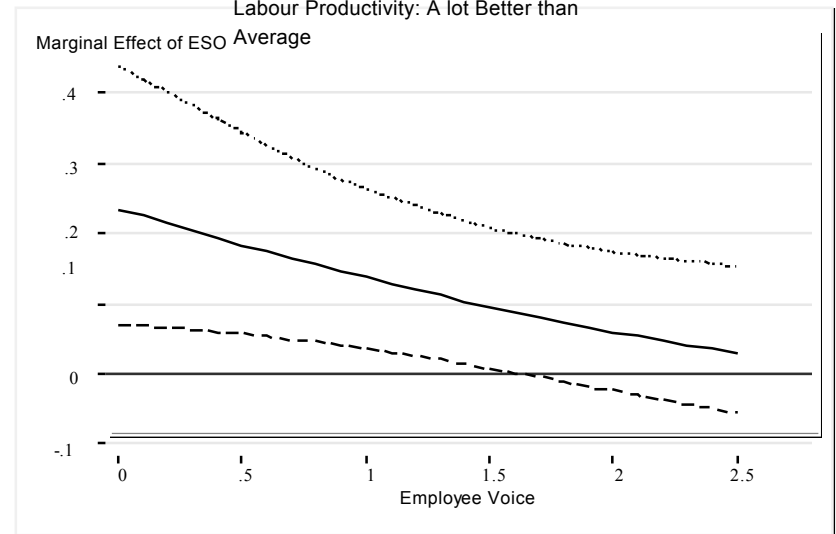
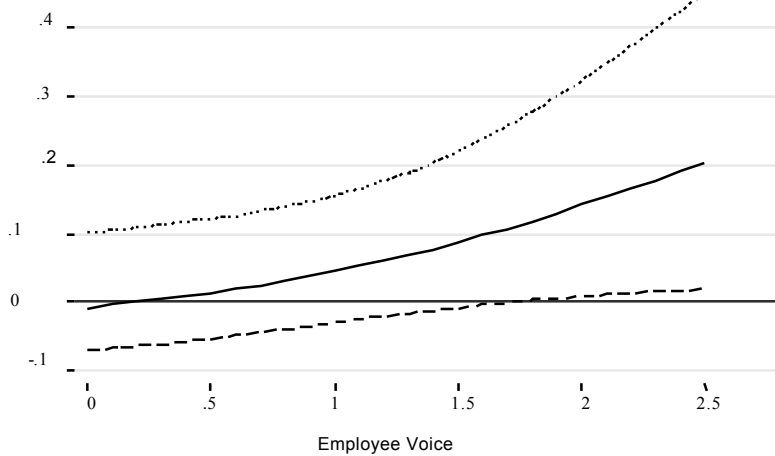


Labour Productivity: A lot Better than Average

Labour Productivity: A lot Better than

Marginal Effect of ESO

Marginal Effect of ESO Average



A broader inference arising from our study therefore is the desirability of paying due accord to the institutional specificities of the plans under investigation.

Our results are consistent with the increasingly widespread view that ESO works via other means than provision of direct incentives, such as development and protection of human capital by sorting, matching, and retention (Lazear 2000; Oyer 2004, Robinson and Zhang 2005). If this is so, other forms of involvement may not be necessary to make stock plans work. Indeed, the results indicate that other forms of involvement can detract from the effects of ESO (e.g. when participation in the stock plan is high). In general, our findings are supportive of the view that that ESO and other forms of employee involvement need to be aligned (Ben-Ner and Jones 1995). The results indicate that alignment is a complex phenomenon, and requires careful attention to the specific features of the practices under investigation. The challenge of future research in this area will be to examine these possibilities more comprehensively.

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Acknowledgement

The authors would like to thank the sponsors of the Workplace Employment Relations Survey 2004 (the Department of Trade and Industry (DTI), Advisory, Conciliation and Arbitration Service (ACAS), Economic and Social Research Council (ESRC), and the Policy Studies Institute (PSI) for access to the data.