Abstract

Some listed firms offer workers the opportunity to buy shares in their firm at discounted rates through employee stock purchase plans (ESPPs). The discounted rate creates a gift exchange where the firm hopes that workers who accept the gift reciprocate with greater loyalty and effort. But ESPPs diverge from standard gift exchange models. Employees have to invest some of their own money by purchasing shares at the discounted rate to accept the gift. A sizeable number choose not to. For workers who buy subsidized shares, an ESPP sets up a group incentive pay system analogous to an employee ownership scheme that makes part of workers' compensation depend on company performance.

Using data from the UK establishments of a multinational firm that places its ESPP at the heart of its employee compensation system, we find workers who purchase shares at subsidized prices work harder for longer hours and have lower quit, job search and absence rates than observationally equivalent workers who do not join the plan. Perceptions that a high percentage of colleagues are members is also correlated with higher worker effort, whether the individual is a plan member or not, suggesting free-riding problems with ESPPs are not as serious as is often assumed. These findings highlight the distinct place of subsidized share purchase schemes in the spectrum of gift exchange and group incentive pay systems.

Key words: share ownership; effort; incentives; gift exchange; job search; quits; sickness absence.

JEL-codes: J24; J33; J54; J63; M52

A substantial literature confirms theoretical conjectures that schemes linking worker compensation to firm performance can induce greater worker effort. These schemes are usually classed as forms of group incentive. They are assumed to induce effort when rational workers calculate that the costs of additional effort are worthwhile because, in contrast to fixed pay schemes, they are able to appropriate some of the additional surplus they generate. However, they are often viewed as "weak" forms of incentive due to the potential for workers to free-ride on colleagues' efforts: in contrast to individual performance pay schemes individuals can anticipate sharing in additional group output irrespective of their own efforts.

Some listed firms offer workers the opportunity to buy shares in their firm at discounted rates through employee stock purchase plans (ESPPs). Employees buying subsidized shares create a group incentive scheme whereby part of their compensation depends on company performance. Plan members have an incentive to be more productive and raise the share price but they and the firm have to overcome the free rider problem in order to make the group incentive work. But an ESPP differs from a standard group incentive system. It covers only workers who join the plan rather than all workers. By allowing workers to choose whether to participate an ESPP creates a dual labor market within the firm between workers with an ownership stake that makes their incomes depend on how the stock market values the firm and workers paid fixed wages.

An ESPP also resembles a gift exchange in which the firm offers workers a gift in the hope that this induces productivity-enhancing or cost-reducing behaviour that increases profits and pays for the gift. But ESPPs are not standard gift exchanges. Employees have to invest some of their own money by purchasing shares at the discounted rate to accept the gift and must hold the shares for a specified period before they can cash in on the gift.

The discount is generally high enough that workers who participate in an ESPP can make a profit even if the share price does not change or falls moderately. Even so, studies of ESPPs find that many workers turn down the gift of the subsidized shares (Engelhardt and Madrian, 2004; Babenko and Sen, 2010). In our analyses of the data used in this paper (XXX, 2010) we found that approximately half of workers in ShareCo (a pseudonym), a multinational business services firm that places its ESPP at the heart of its employee compensation system, did not join the ESPP. Some workers had economically rational reasons for not joining. They were planning to leave the firm shortly or were sufficiently cash-strapped to make it difficult to finance the purchase of shares. But others seemed to reject the gift for reasons more aligned with behavioural economics findings about hyperbolic discount rates, procrastination, and the influence of peers rather than economic calculation.[1]

In this paper we compare the work behaviour of employees who joined the ShareCo ESPP with that of observationally equivalent workers who did not join the plan. Our analysis is based on a survey we conducted of the firm's UK and Ireland employees in 2010. Section One describes ShareCo's share plan. Section Two presents the hypotheses tested in the paper. Section Three introduces the survey we administered to workers and the statistical model we use to measure differences in behaviour. Section Four gives our estimates of the differences in behaviour between observationally equivalent ESPP members and non-members. We

[1] For similar findings in another firm see Degeorge et al. (2004).

discuss whether the differences reflect responses to the ESPP or the selectivity of who joins before concluding in Section Five.

1. The ShareCo Plan

ShareCo is a multinational business services corporation. Its ESPP is a major part of its compensation package. With the exception of commission payments made to 18% of staff and an executive share plan available to top executives in the firm, it is the only incentive scheme offered by the firm, and it is the only one which all employees at the firm are eligible to join. Most of the firm's employees are white collar workers who receive considerable information from the firm about the plan. The plan is a Shareholder Incentive Plan (SIP) that qualifies for tax exemptions under United Kingdom government rules so that workers benefit from tax breaks as well as the firm subsidizing the price of shares.[2] All employees paying tax in the UK are eligible to join. SIP rules provide tax advantages for employees who contribute a minimum of £10 each month up to a maximum amount of £125 or 10 per cent of their monthly pre-tax earnings, whichever is the lower amount, to purchase shares.[3] The money spent on shares is exempt from income tax and national insurance contributions as long as the employee retains the shares for at least five years. Employees who sell the shares in the first two years after purchase pay income tax and national insurance on the full value of the shares at the time they are sold. Shares sold in years 3 or 4 are taxed on the value of the shares when the employee bought them or at the current market value, whichever is lower. Thus there is a substantial tax break for holding the shares for five or more years and a smaller tax advantage to retaining them for three years before selling them.

ShareCo matches each share an employee purchases up to a value of £125 per month on a one-for-one basis. By matching share purchases one for one, ShareCo effectively gives one free share for every share the worker buys or alternatively gives a gift of half the price of every share the worker buys (up to the specified limit). The matching shares are taxed in a similar way as shares bought under the SIP rules.[4] Employees can invest their dividends in dividend shares. Barring a catastrophic fall in share prices, most employees should find the ESPP financially attractive.[5]

2. Hypotheses

We test four broad hypotheses arising from the literatures on incentives and gift exchange.

The first hypothesis is that those belonging to the ESPP will expend greater effort than observationally equivalent non-members, even where they share the same working environment, as indicated by working in the same office and business division. This prediction holds if the ESPP creates incentives for ESPP members to put forth additional

[2] Firms following these tax guidelines have discretion as to the precise nature and generosity of the plan, including offering free shares. ShareCo's matching scheme is typical of SIP plans in the UK. We thank to Michael Landon for discussion of this point.

[3] Following the passage of new legislation these maximum thresholds were raised in 2014.

[4] Matching shares must remain in the plan for at least three years. When employees leave the company the shares can no longer remain in the plan. Precisely what happens to the shares depends on the reason for leaving. For example, if the employee leaves due to redundancy or retirement all shares are transferred to the individual without tax or national insurance liability.

[5] ShareCo's shareholding employees have the right to vote at shareholder meetings.

effort due to the link between their efforts and the value of the company. But it is also consistent with the ESPP creating a gift exchange whereby employees who perceive the ESPP as a gift from ShareCo will reciprocate with additional effort.[6] The specific features of the ESPP may affect the size of any such response. On the one hand, the fact that employees must pay for shares from their own wages may lead to a substantial effort response if one thinks of the wage payment as a commitment device, that is, a means of eliciting employee additional commitment to the incentive or gift exchange (Bryan et al., 2010). On the other hand, the need to contribute salary to enter the ESPP reduces the net worth of the incentive, or the size of the gift, which might lead to a more muted employee effort response. One can capture the degree to which employees are vested in the plan by ranking them according to their wage/share plan investment ratios. Those with larger investments relative to their wage may be thought to have greater financial incentives, or a greater commitment to the ESPP, which might lead to higher effort levels than those whose investments are smaller. However, there is a cap on the payments employees can make into the ESPP and a cap on matched shares, preventing employees who wish to do so from making more sizeable investments.

Our second set of hypotheses seeks to establish the mechanisms by which ESPP membership may affect effort and, in doing so, try to ascertain whether those effects may be attributable to gift exchange. First we hypothesise that if employees reciprocate for the ESPP gift with effort this will be partly attributable to their increased loyalty to ShareCo. There is evidence, that gift exchange increases organisational loyalty, and that organisational loyalty is associated with improved performance (Mowday, Porter and Steers, 1982; Brown et al., 2011). If we assume that ESPP membership raises organisational loyalty, the introduction of a measure of organisational loyalty into an effort equation should partial out at least some of the effect attributable to ESPP membership. If the membership coefficient is largely untouched by the introduction of organisational loyalty this is more consistent with ESPP operating as a financial incentive since, having conditioned on wage levels, there is little reason to suspect that financial incentives engender organisational loyalty – unless, that is, workers perceive those incentives as part of a fair wage (Akerlof, 1984). Indeed, financial incentives are sometimes thought to militate against organisational commitment and loyalty (Frey and Jegen, 2000), in which case the membership coefficient may even rise with the introduction of organisational loyalty. In sensitivity analyses we condition on a separate measure of perceptions of fair pay to isolate any organisational commitment effect.

Another mechanism by which ESPP membership may affect worker effort is through perceptions of firm ownership. Members, by owning shares in ShareCo, are more likely to feel like owners of the firm than other employees who simply draw a fixed wage. Feelings of ownership are likely associated with increased worker effort since workers perceive they have a stake in the firm that extends beyond their employment contract. If one considers this from a principal-agent perspective, it is as if employees – ordinarily the agents – become the

[6] Laboratory experiments identify a clear causal relationship between efficiency wages and effort (Fehr et al., 1996) that confirm the "fair wage-effort" hypothesis (Fehr et al., 1993: 437). But Gneezy and List (2006)'s field experiment found the positive impact of the "gift" of higher wages on effort does not persist over time; and in their field experiment Hennig-Schmidt et al. (2010) find no change in work effort associated with changes in one's own wage and suggest in a follow-up laboratory experiment that employee reciprocity requires knowledge about the surplus at stake. By contrast, Fehr and Götte (2008) find increased wages increase the overall labour supply in total and the hours of work provided, but not the effort per hour. We condition on wage levels to isolate any link between the ESPP and employee effort.

principals by virtue of their ownership. It is uncertain, a priori, whether the ownership stakes most ESPP members have are sufficient to influence their behaviour by exerting additional effort, but our "perceived ownership" metric captures the sense of ownership, perhaps even better than the actual pecuniary value of the shares held. It follows that, if the ESPP membership coefficient falls appreciably with the introduction of the perceived ownership scale, we can infer that at least part of the ESPP effect on effort is attributable to ownership effects.

A third means of identifying what type of mechanism might be at play in linking ESPP membership and effort is by running results separately for men and women. Research suggests that there are gender differences in the propensity to reciprocate, with the most recent study suggesting women are less likely to reciprocate in response to a gift than men (Dittrich, 2015).[7] But there are no reasons to believe that there are gender differences in responses to financial incentives.[8] Thus, larger ESPP effects on effort among men compared with women might be interpreted as evidence in favour of ESPP being akin to a gift, whereas no significant gender differences would be observed if it operated primarily as a financial incentive.

Our third set of hypotheses relate to the effects of colleagues on effort. Empirical studies find workers' productivity can be affected by that of one's colleagues (Mas and Moretti, 2009) and that these effects may be particularly important where workers are paid for performance and are socially connected (Bandiera et al., 2009; Babcock et al., 2011). We hypothesise that employee effort will rise with the ESPP membership rate among colleagues as workers respond to the additional efforts made by those around them responding to incentives created by the plan.[9]

The fourth and final proposition we test is that any seeming effort differential between ESPP members and non-members is driven by unobservable differences between members and non-members and is therefore spurious. It may be that more productive workers are more likely to join the plan, in much the same way as more able individuals select into firms with individual incentive plans (Lazear, 2000). If the more able ShareCo employees join the plan it may be this selection effect we are picking up in any association between ESPP membership and effort. The ways in which we explore the possible causal effects of ESPP membership are discussed in Section Three.

3. Data and Estimation

3.1 Data

[7] As the authors note (p. 3827) the experimental evidence on this issue is contested.

[8] It is true that, at least in some settings, women are less likely to enter competitive tournaments, suggesting a distaste for competition (Niederle and Vesterlund, 2007) but in our setting there is no competitive component to any financial incentives offered under the ESPP. In this sense the ESPP is quite different from individual performance pay schemes based on relative performance which can pit workers against one another (Bandiera et al., 2005).

[9] Others have pointed to the importance of group identity for worker productivity. Falk and Ichino (2003) show levels of effort depend on interactions with co-workers. Fehr and Gachter (1999: 362) note "group identity is like a lubricant that makes social exchange effective".

In November-December 2010 we surveyed employees in the UK and Irish business operations of ShareCo. With the assistance of company management we designed a web-based questionnaire and invited the company's 1,740 employees in the UK and Ireland to visit a password-protected survey website and fill out the questionnaire. Because we had company support for the survey, we obtained a high response rate. Seventy-two percent of employees (1,251) visited the survey website, 96% of cent of whom answered the survey (1,205), giving a 69% response rate relative to the total workforce. Anonymity was guaranteed to respondents in a letter requesting participation in the survey: no unique identifying information was disclosed to ShareCo nor to us as the analysts, thus minimizing the likelihood that the probability of responding or the responses given could be biased by concerns regarding the company's expectations of its employees.

The survey contained 72 questions divided into subsets relevant to persons with different share plan membership and purchase histories. Respondents answered the appropriate subsets so no one answered the full 72 questions. The survey asked about employee demographics (age, gender, household circumstances, education), attitudes toward risk and sociability; the job (wages, occupation, hours worked, whether the worker was paid hourly, on a salary basis, or on a salary with a commission); the business unit and office in which the employee worked; membership in the share plan, share holdings, contributions; questions about attitudes towards the job and the company, and the factors that influenced decisions to join or not join. It also asks a number of questions about employee effort from which we derive the following dependent variables: how hard employees think they work relative to others, hours worked above contractual hours, absences, job search, and prospective quits, and whether or not they intervened when they saw other workers not working as they should.[10]

3.2: Estimation

We estimate regression models to establish whether there are differences in behaviour of those who join the ESPP compared to those who do not. The models contain covariates for demographic and job characteristics to isolate differences in work behaviour associated with plan membership and those due to differences in observable personal and job-related factors. Our baseline equation relates the work behaviour of worker i to plan membership, conditional on personal characteristics and the characteristics of their job:

1) $$E_i = \beta_1 Plan_i + \beta'_x X_i + \varepsilon_i$$

where E_i measures worker behaviour defined in various ways for individual i, $Plan_i$ measures the plan status of the individual and β_1 estimates the effect of plan participation on worker behaviour. The X_i's are a vector of individual-level demographic and job characteristics (see note 3 to Table 1 for details). These include variables that are often unobserved in standard data sets but may be important in explaining both the propensity to join an ESPP and worker effort, such as employees' risk preferences and sociability.[11] To test

[10] A copy of the web questionnaire is available from the authors on request.

[11] The risk scale is based on the question "Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?" where 1="unwilling to take risks" and 10="fully prepared to take risks". The sociability scale counts the number of times employees ticked a box in response to the following question: "Do

some of the hypotheses outlined in Section Two we condition on additional variables such as organizational loyalty[12] and perceptions of employee ownership in the firm.[13]

For each dependent variable we also estimate models where we add dummy variables for the employee's work unit.[14] When we include work unit dummies we are estimating differences in behaviour between workers who joined the plan and those who did not join within the same office/business units. This controls for unobservable fixed elements of the working environment which might induce plan participation and affect behaviour. If the relationship between our dependent variables and plan membership is picking up effects common to a workplace, inclusion of these dummies would reduce the estimated β1 coefficient.

To capture spill-overs associated with colleagues' plan membership we run separate member and non-member models incorporating a measure of individual i's perception of the percentage of employees in the business unit who belong to the Plan.[15]

Estimates of equation 1 will pin down the β1 coefficient that measures differences in behaviour between observationally equivalent persons who have joined the ShareCo ESPP and those that have not. Accepting the gift/incentive may induce people to change their behaviour along the lines of gift-exchange/efficiency wage or of group incentive models of behaviour. There is sufficient evidence from econometric and laboratory studies to make such an interpretation of differences in behaviour a reasonable one. But estimated differences in work behaviour need not be due solely (or at all) to responses to the ESPP. Selectivity of persons into the ShareCo ESPP based on characteristics of workers that are unobservable to us could also explain differences in work behaviour: a productive worker who is gungho about their job and the firm may accept the gift but not change their behaviour when they join the ESPP.

We consider just how plausible a causal interpretation is in two ways. First, we asked employees about the causal impact of the share plan on their behaviour. If members of the

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you take part in the following activities, either as part of your job or outside work? Please select as many as apply to you...Member of a trade/professional body or association; work in schools, colleges, universities; involved in charities or voluntary bodies; member of a social, sports or arts club; active member of a political party; active member of a religious group; socialising with co-workers outside of work".

[12] The measure of organizational loyalty is an additive scale capturing employees' sense of loyalty and attachment to the firm. Employees are invited to code themselves along a five-point Likert scale running from "strongly agree" to "strongly disagree" in response to the statements "I feel very loyal to this organization", " I find that my values and the company's values are very similar" and "Overall this company is a good place to work". The scale is scored from 3 (low attachment) to 15 (high attachment) and a scale reliability coefficient of 0.84. A second additive scale which has a reliability coefficient of 0.75 captures the degree to which employees feel they are fairly paid. It runs from 1 to 10 and is based on the same Likert-scale coding in response to the statements "I am fairly paid relative to my ShareCo colleagues in a similar job" and "I am fairly paid relative to employees with similar jobs in other companies". Correlations between the five items used for the two scales were explored using principal components factor analysis with varimax rotation. The items loaded on the two dimensions used to compute these two scales with eigen factors of 1.17 and 2.72 respectively.

[13] Feelings of ownership are measured as responses to the question "How much do you feel like a co-owner of this company?", with responses running from 1 ("not at all") to 10 ("very much").

[14] We use the intersection of ShareCo's 18 business unit and 16 office location to obtain a closer fix on likely "work groups" where employees may interact regularly. This yields 46 work units with more than one respondent.

[15] Responses are coded in seven bands from 'none' through to 100% with the mid-band being 40-59%.

share plan said that it did not affect their behaviour, we would find it hard to argue that it did. If they say it has affected them, and the direction of effects is consistent with the observed differences in behaviour between workers who join the plan and those who do not, this is suggestive evidence in support of a causal relationship. There is no incentive for workers to "game" the survey, which is anonymous and presumptively incentive compatible. In our earlier study workers said that they paid little attention to what the human resource department told them about the plan (XXX, 2010).

Our second approach is to undertake propensity score matching (PSM). Matching estimators rely on the same identification assumption as regression analysis, namely that that selection into ESPP membership is captured by observables. In the literature this is known as the Conditional Independence Assumption (CIA) since it assumes that treatment – in this case membership of the ESPP – is independent of the error term in the outcome equation, conditional on the observable traits contained in the matching estimator. However, there are advantages to running our regression analyses in conjunction with PSM. First, matching ensures that the member and non-member subsamples are balanced on conditioning X's, as one would anticipate if membership was randomly assigned across the two groups. Second, by enforcing common support between ESPP members and non-members we drop any members whose estimated propensity for membership is too far from non-members' for them to have a credible counterfactual. As we show below this results in the deletion of 19 plan members from the baseline estimation sample. Analyses presented in Section Four are run on this sub-sample where there is common support for the plan members among the non-members. In addition non-members in the estimation sample are weighted with matching weights based on their propensity for membership. These give larger or smaller weight to non-members according to how closely their propensity scores match those of the plan members within the common support.

Estimates based on propensity score matching are unable to account for selection into membership based on unobservables. However, we are able to establish how robust our results are to omitted variables bias using techniques developed by Altonji et al. (2005) and Oster (2015). These techniques, described in more detail in Section Four, allow us estimate how sensitive the membership coefficient is to omitted variables in models which explain more of the variance in worker effort on the assumption that the unobservable variables are as important in selection into ESPP membership as observable variables.

3.3: Propensity Score Matching

Before turning to results we provide further information on the PSM used to construct counterfactuals for the ESPP members. We estimate the propensity to be an ESPP member using the probit model presented in the Technical Appendix Table A1 where the dependent variable is the (0,1) dummy for membership and the independent variables, which are thought to affect both membership and worker effort, are: age, age squared; male; white; degree; married or living as married; risk scale; occupation (7 dummies); supervisory status; hours worked (4 dummies); tenure and tenure squared; log annual wages.

In order to recover the average treatment-on-the-treated (ATT) effect of ESPP membership we use the estimated propensity scores to identify those treated cases for whom there is common support in the untreated (non-member) sample. It is apparent from Figure A1 in the

appendix that common support is offered by non-members for all but a small number of members with very high propensity scores. We drop these 19 cases since it is not possible to recover counterfactuals for those cases. To construct the comparison group we use a kernel density estimator with a normal distribution to obtain comparators for the ESPP members such that the weight attached to a particular comparator is proportional to the frequency of the distribution for the difference in scores observed.[16] Thus the size of the weight for comparators gets larger the more exact the match to the treated observation. The weights for the comparator group range between .075 and 6.73 with a mean of 1.10.

The purpose of the matching is to balance characteristics across the treatment and matched comparison groups. In doing so we deploy bootstrapping with 50 replications to achieve reliable standard errors. The quality of the matching is very good, as indicated by the reduction in standardized percentage bias[17] the covariate distributions for ESPP members and non-members pre- and post-matching (see Appendix Table A2).

4. Results

Table 1 presents estimates of $\beta 1$ for six measures of worker effort and behaviour. Column 1 headed "Unmatched" shows the raw difference in mean scores between ESPP members and non-members in the pre-matched sample. Column 2 headed "ATT" is the average treatment on the treated for members with common support recovered after kernel density matching where estimates are weighted using the kernel matching weights. Column 3 entitled "OLS" gives the $\beta 1$ coefficients from equation 1 for the sample with common support where the model is weighted with the kernel matching weights. Finally column 4 is the same as column 3 but includes dummy variables for work unit so that the $\beta 1$ coefficients recover the ATT within work unit.

[INSERT TABLE 1]

The key finding in the table is that ESPP members perform better than those who do not join the share plan in all but one area of work behaviour regardless of the model specification. The exception is in their response to observing a worker who is not doing a very good job. Here members and non-members do not differ in their behaviour.

The first dependent variable in the table relates to work effort relative to others. It is derived from answers to two survey questions about work effort. The first question is: "How hard would you say you work?" with responses on a 1 to 10 scale where 10 is "very hard" and 1 is the opposite. The second question is about the effort of other workers: "At your workplace, how hard would you say that people work?" with responses coded on the same scale as above. Plan members reported an average effort of 8.92. Non-members of the plan reported an average effort of 8.76 – a difference that is statistically significant at a 99% confidence level. By contrast, both members and non-members rated the effort of other workers similarly. Members give a mean score of the effort level of others of 7.67 and non-members give a mean score of 7.70. Differences in working harder relative to others between members

[16] Matching is undertaken using STATA's PSMATCH2 command (Leuven and Sianesi, 2003).

[17] The standardized percentage bias is the percentage difference of the sample means in the treated and non-treated (full or matched) sub-samples as a percentage of the square root of the average of the sample variances in the treated and non-treated groups.

and non-members thus reflect differences in the own work effort question. The membership coefficient actually rises after matching (compare column 2 with column 1). The member/non-member differential in working hard relative to others remains statistically significant, albeit less precisely estimated, in the OLS and work unit fixed effects models run with matching weights (columns 3 and 4 respectively).

The second dependent variable in Table 1 relates to hours worked relative to contractual hours worked. In the unmatched sample plan members worked an average of 2.7 hours per week more above their contractual hours than non-members. However, the differential falls to 0.7 hours after matching. Although the differential is lower in the OLS estimates and is not statistically significant the differential rises once again and is statistically significant in the work unit fixed effects model. Since most workers at ShareCo are not paid overtime[18], the long-hours of work for plan members cannot be attributed to an overtime premium.

The third measure of workplace behaviour in the table come from the question "how many days have you been absent from work in the last six months (excluding vacation)?". Plan members took less absence than non-members: 43 percent had taken some absence compared with 58 percent of non-members. The dependent variable in regression 3 is a categorical variable for the number of days absent (excluding vacation) in the last six months. There is a statistically significant negative association between plan membership and absence behaviour across all model specifications.

The fourth dependent variable comes from a question about whether the worker expected to leave the firm voluntarily within 12 months. Two percent of plan members compared to 8 percent of non-members said they intended to leave. This association holds up in all specifications. However, some people do not join the plan because they anticipate quitting in the near future, making it more difficult to infer a causal link running from ESPP membership to quit intentions. Our survey asks those who have never joined what their reasons are. Of the 474 non-members in the matched estimation sample 54 (11%) state that they don't intend to be with the company long. We reran estimates dropping these cases: the negative correlation between membership and the probability of quitting becomes statistically non-significant, suggesting that the association is partly attributable to reverse causation.[19]

The dependent variable in the fifth regression comes from the question: "how likely is it that you will actively look for a job with another organization in the next 12 months?" with the likelihood recorded on a Likert scale running from 1 ("not at all likely") to 5 ("very likely"). The regressions show that plan members were significantly less likely than non-members to anticipate actively seeking work elsewhere in the coming 12 months, a result that holds up across all estimates.

If the motivation for staying with the firm stems from maximizing financial returns from share plan participation, the link between membership and lower quit and job search probabilities would likely be strongest as workers approach five years in the share plan since that is when the sale of shares are most tax-advantaged. We tested this proposition by

[18]Eighty-six percent of employees receive no paid overtime in any given month (personal communication from the company).

[19] All other results in the table were robust to the exclusion of this group.

replacing the membership dummy with a variable identifying the time employees had been in the share plan and found that the effect of plan membership on the likely quit behaviour and searching for another job do not differ significantly between members with under five years in the plan and members with at least five years in the plan.[20]

The last dependent variable in Table 1 captures worker responses to seeing another employee not working as they should. We took the question from the NBER shared capitalism questionnaire (Freeman, Kruse and Blasi, 2010) : "If you were to see a fellow employee not working as hard or as well as he or she should, how likely would you be to...discuss this with the employee; speak to your supervisor or manager; talk about it in a work group or team; do nothing", with possible responses from "not at all likely" through to "very likely". We sum responses to the first three questions with "not very likely" scoring 0, through to "very likely" scoring 3 to construct an additive scale. Because workers are more likely to take action the easier it is for them to observe how hard co-workers are working and are less to likely to intervene when they are closely supervised (Freeman. Kruse, Blasi, 2010) we include these variables as additional independent variables in this analysis.

We find no association between plan membership and greater co-worker monitoring. These results differ from those in Freeman, Kruse, and Blasi (2010) who found that workers paid through group incentive systems were far more likely to monitor fellow workers and intervene when they find other workers performing poorly. The likely reason for this is the division within an ESPP between workers who have joined the plan and those who have not. In an environment where all workers are covered by the same group incentive system, workers can press fellow employees to do their best in the interest of all. By contrast, in a place where only some workers have aligned their income with firm performance, the division of workers into members and non-members may make it more difficult for some to press others. This suggests that members would engage in more co-monitoring when they are in an environment with relatively more members. We tested this explanation by estimating the co-monitoring equation separately for members and non-members (Table 4). The coefficient on perceptions of membership rates among co-workers was significantly positive for members but not for non-members, consistent with the view that employees engage in more co-worker monitoring when they think more workers are in the plan and should therefore reciprocate on the gift than when they think that more co-workers have rejected the gift/incentive exchange.

We ran variants of the models reported in Table 1 to see if those with larger investments relative to their wage exhibited greater effort levels, as might be the case if greater investments had stronger incentive effects, or operated as a stronger commitment device, or perhaps generated a greater reciprocal response to the free matching shares offered by the firm. We ran separate models proxying the size of the investment with monthly financial contributions to the plan and current shareholdings. Neither had a clear, monotonic relationship with employee behaviours.

In trying to establish the mechanism by which ESPP membership is linked to worker behaviours we first test the proposition that the membership effect can be accounted for by

[20] Dropping non-members from these models confirms no significant difference in the quit and job search probabilities of members below and above the five year threshold. These results are available from the authors on request.

the generation of organizational loyalty (OL) and perceptions of fair pay (FP) that the plan can engender among members. Although our cross-sectional data mean we cannot be sure whether members are simply more likely to express OL and FP than non-members, it is plausible that the ESPP can generate OL and FP as a gift exchange or efficiency wage mechanism, as established in the literature discussed earlier. In fact, organisational loyalty and perceptions of fair pay only appear to affect the association between ESPP membership and worker behaviour in relation to two of our six measures, namely voluntary quits and job search. Greater loyalty is significantly associated with a lower propensity to quit or seek work elsewhere, while perceptions of fair pay negatively affect job search. When entered into the models presented in Table 1 they reduce the size of the membership coefficient (Table 2). However, ESPP membership continues to have a sizeable and statistically significant association with lower quit intentions and a lower probability of searching for another job. Thus OL and FP do not account for the associations between ESPP membership and worker behaviour reported in Table 1.

[INSERT TABLE 2]

We also hypothesised that ESPP membership effects on worker behaviour could be accounted for by feelings of co-ownership that it may engender. The introduction of perceptions of co-ownership had little effect on the results reported in Table 1. The only exception was with respect to job search where the negative and significant link between co-ownership feelings and job search resulted in a small reduction in the membership coefficient. However, even here the membership coefficient remained strong and statistically significant.[21]

Separate estimates for men and women reveal rather different results. In the case of men the association between ESPP membership and behaviour is only apparent at the extensive margin of worker effort, namely with respect to voluntary quits and job search. Among women, ESPP membership is also associated with a lower likelihood of seeking work elsewhere, but is not correlated with intentions to quit. Furthermore, there are strong associations between membership and the intensive effort margin among women, as indicated by the positive association between membership and working hard relative to colleagues, and its negative association with days of absence. Although these differences are striking they do not correspond with a clear gender differential in membership effects, as one might have anticipated if the plan operated via gift exchange. Nor do they correspond with the absence of gender effects we might have expected if it operated purely as a financial incentive scheme. Thus the results do not provide clear evidence that might help us to distinguish between the gift exchange and financial incentive mechanisms that might be at work.

[INSERT TABLE 3]

In Table 4 we explore the possibility that perceived membership rates among peers may have a spill-over effect on one's own behaviour. This appears to be the case. As noted above, members' monitoring efforts rise with the proportion of their peers who they think are plan

[21] For instance, the membership effect of -.441 reported in row 5 column 2 of Table 1 fell to -.300 (t-stat=3.31) when the matching incorporated co-ownership.

members, something that does not happen to non-members. Non-members seem less inclined quit or to seek a job elsewhere where they are surrounded by what they perceive to be a higher percentage of plan members. One might anticipate workers working harder if they feel more plan members are "breathing down their neck" monitoring what they are up to. In fact, as row 1 indicates, both members and non-members perceive their relative hard work to be lower where they are surrounded by more members. A natural explanation for this finding is that both members and non-members equate membership with hard workers, such that perceptions of higher membership rates are associated with higher estimates of colleagues' work efforts.

[INSERT TABLE 4]

Finally we turn to the question of whether the associations we have uncovered might plausibly identify a causal link between ESPP membership and worker behaviours. In doing so we draw on two types of evidence. The first is direct reports from employees regarding their perceptions of ESPP effects. The second uses statistical techniques to establish how robust the results are to assumptions regarding the size of omitted variables bias.

ShareCo's share price mattered to its employees. One-quarter of employees checked the share price daily, but this was true for 38% of members compared with 13% of non-members. Since the share price is salient in employees' minds it does seem possible that their behaviours might be affected by their ability to influence that share price. We begin with employee reports on their assessment of how the share plan impacts their quit behaviour and work motivation. We asked workers if the ShareCo share plan "reduces the chance that you will leave the firm". Sixty-six percent of plan members answered “to some extent” or “to a great extent” while by contrast, just 24 percent of non-members so reported. One interpretation of the 24% number is that even non-member workers view the plan as an indicator that ShareCo is a good employer, and are more likely to stay. Another interpretation is that the 24% reflects some baseline fraction of workers who intend to stay with the firm and latch onto the reason for staying that the question poses. The key statistic is the 42 percentage point difference between plan members and non-members who cite the plan as a factor that reduces the chance of exiting the firm. To probe this interpretation we regressed the dichotomous variable of whether or not workers cited the plan as reducing their chances of leaving by a lot or to a great extent on plan membership in multivariate regression model 1. The regression estimate of the effect of plan membership on citing the plan as reducing the chance of leaving in the future was 0.32, smaller than the difference in means but still large and statistically significant.

We also asked workers if the ShareCo share plan "increases your motivation". Sixty percent of members said "to some extent" or "to a great extent", compared to 21 percent of non-members, which gives a 39 percentage point difference. This difference also remains large and significant in regression analyses based on equation 1. Workers at least believe that their joining the plan affects their work behaviour.

[INSERT TABLE 5]

In Table 5 we explore how sensitive the membership coefficient is to omitted variables bias. Using methods pioneered by Altonji et al. (2005) and developed by Oster (2015) we can,

based on some rather strong assumptions, establish the robustness of the ESPP membership coefficient to omitted variables bias by examining the movement in the coefficient with the addition of controls and by altering the share of the variation in the treatment effect accounted for by control variables. The former is achieved by comparing the raw differential in worker behaviour between plan members and non-members with the differential that obtains when conditioning on the observables in the model (comparing columns 1 and 2 in Table 5), while the latter is achieved by rescaling the explanatory power of the model (as we do in columns 3, 4 and 5 of Table 5). Our sensitivity estimates assume that observed and unobserved variables play an equal role in selection into membership - what Oster (2015: 3) refers to as the equal selection assumption. It is apparent that some of the membership coefficients fall quite markedly when we rescale the explanatory power of the model. This is most notable in the case of hours worked (where the membership coefficient actually turns negative) and absence. The estimates suggest that, on the basis of the fairly conservative equal selection assumption, the membership effect on hours worked and reduced absence is not particularly robust to rescaling the explanatory power of the model. Although the negative correlations between membership and quits and job search diminish somewhat they remain fairly robust, while the working harder coefficient actually rises as we increase the explanatory power of the model, a result that arises because the membership coefficient rises as we move from the uncontrolled, raw differential to the controlled effect (column 1 to 2). Membership has no effect on co-worker monitoring and this remains the case. We can infer from this sensitivity check that the membership effect on working harder, quits and job search is robust to reasonable assumptions regarding omitted variables bias whereas its association with working longer hours and absence taking is not so robust.

5. Conclusion

This study has found that employees belonging to an Employee Share Purchase Plan (ESPP) exert greater effort at work than their non-member counterparts, as indicated by perceptions of working harder, working longer hours above contract, and taking less sickness absence. They are also less likely to express a desire to quit and are less likely to be seeking employment elsewhere. We present evidence suggesting the association is causal. First, employees responding to the survey concur with a causal interpretation. Second, some of these effects - those relating to working harder, quitting and job search - are robust to reasonable assumptions about bias induced by omitted variables, although others relataing to longer hours and absence taking appear less robust. Third, the effects are apparent even within work unit (as defined by the office and business sector to which the employee belongs), indicating that they are not driven by unobservable features of the working environment. Fourth, there appears to be a spillover effect from colleagues' ESPP membership since higher membership density within a work unit induces greater work effort, regardless of whether an individual is a member or non-member of the Plan. This spillover effect is particularly notable in the case of co-worker monitoring: members engage in no more co-worker monitoring than their non-member counterparts, but higher membership density increases co-worker monitoring among members only, as one would anticipate if members feel able to exert pressure on their member colleagues to limit free-riding.

As well as establishing that there appears to be a link between ESPP membership and worker behaviour which is plausibly causal we sought to establish whether the effects correspond to what one might anticipate from a group incentive scheme, on the one hand, or a gift exchange

on the other. We devised some simple tests but results are inconclusive. We hypothesised that if ESPP effects operated primarily as a result of gift exchange then these effects would be substantially reduced if direct measures of organisational loyalty and fair pay were introduced into our estimates as controls. Although ESPP members expressed greater organizational loyalty than non-members this difference did not account for the member-non-member differential in worker effort. It did play some role in accounting for differentials in relation to job search and quits but, even here, the underlying difference between members and non-members persisted once controls for loyalty and fair pay were introduced. We further hypothesised that if ESPP effects were linked to reciprocity arising from gift exchange these would be more apparent among male employees compared to female employees. Although there were gender differences in the membership effects support for stronger effects for men was not apparent. On the basis of the tests we undertook we can not discount the possibility that ESPP effects derive from both group incentives and gift exchange. Our results resemble the findings in studies of gift exchanges that find that workers respond to gifts given up front by reciprocating with better performance in the future and to studies of group incentive systems that find that workers respond to group incentives with better performance as well. What is distinct about our analysis is that the findings are based on the responses of workers who accept/reject the treatment rather than on comparisons of workers across workplaces that give all workers the same treatment.

ESPPs, gift exchanges, and group incentive systems have one overriding similarity. None of these schemes could succeed if all workers followed the logic of free-riding behaviour. Free riders would accept higher wages in a gift exchange model and do nothing to improve the performance of the firm. Free riders would purchase subsidized shares and do nothing to improve performance and raise the share price. In both cases the firm would be out of pocket for its initial gift and would either stop granting the gifts in the future or lose market share to firms that paid fixed wages. The economics of a group incentive system is a bit different. Free riders would not respond to the group incentive so it would have no effect on output but, assuming the incentives were set correctly, this would cost the firm nothing. The firm could leave the system in place or not. It would not matter. That these systems are found in labour markets throughout the world and are associated with better performance implies that all three overcome the free rider incentive in some fashion. The differences among them are subtle. In a gift exchange/efficiency wage model, the firm bears the initial risk that employees will not reciprocate. The workers who reciprocate bear a risk that they may do too much in response to the gift and not get their full share of their extra effort. But ideally the system will equilibrate the level of gifts to produce benefits for both workers and the firm which balances the marginal costs and benefits to the worker and firm. In a group incentive system, the firm bears no initial risk. Workers who respond to the incentives get a share of the benefits. If the firm has set the incentives appropriately the system will produce benefits for workers and firms with each balancing their marginal benefits and costs.

Abstracting from the mechanisms by which firms/workers overcome free-riding and risk issues, an ideal gift exchange system and an ideal group incentive system will produce the same outcomes, with a size of the gift/parameter for group incentive pay that leaves no "extra output" on the table. An ESPP has attributes of both systems. It offers the gift of subsidized shares but it also offers group incentive pay since the value of shares will be higher the higher workers' effort. It also differs from gift and group incentives by requiring workers to put up some of their own money to take advantage of the gift. If all workers join the plan, the ideal

ESPP would produce the same outcome as the ideal gift exchange and group incentive systems. Tax incentives aside, the firm would subsidize shares in such a way as to leave no extra output on the table. The part of an ESPP that offers unique insight into behaviour is its allowing workers to accept or reject the gift of matched shares. Again abstracting from the mechanisms that overcome free riding, workers who accept the Plan presumably have lower disutility of work than those who reject the plan. By allowing workers to choose to reciprocate or not, the ESPP is presumptively socially more efficient than gift exchange or incentive systems that treat all workers the same. Future research which randomly assigns features of these schemes to workers, either in the field or the lab, could shed further light on the links between such schemes and which might be optimal in different settings.

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Table 1: Estimated Differences in Behaviour of ESPP Members and Observationally Equivalent Non-members

	Unmatched	**ATT**	**OLS**	**Fixed effects**
1) How hard workers work relative to how hard other employees work (-10,10)				
	.194 (1.97)**	.227 (2.28)**	.218 (1.91)*	.263 (1.87)*
2) Hours worked relative to contractual hours (0,45)				
	2.685 (8.06)***	0.670 (1.80)*	0.323 (1.07)	0.715 (2.00)**
3) Days absent, categorical (0,6)				
	-.698 (6.16)***	-.251(2.28)**	-.233 (2.54)***	-.282 (2.11)**
4) Voluntary quits (0,1)				
	-.062 (4.77)***	-.051 (2.35)**	-.048 (2.67)***	-.047 (2.48)**
5) Job search, categorical (1,5)				
	-.551 (8.30)***	-.441 (4.52)***	-.407 (7.11)***	-.428 (5.28)***
6) Intervening with another worker who is not doing good job, additive scale (0,9)				
	.263 (2.03)**	-.026 (0.15)	-.043 (0.37)	.006 (0.04)

Notes:
(1) Unmatched shows the raw difference between members and non-members in the pre-matched sample where N=1,063. ATT is the average treatment on the treated following kernel density matching. Bootstrapped estimates with 50 repetitions. N=1,044 after removal of 19 members without common support among members. Standard errors for the OLS are clustered by office/business unit. Fixed effects is the fixed effects regression absorbing 37 office/business unit categories. OLS and fixed effects are run on N=1,044 cases with common support and are weighted with pweights from the matching estimator.
(2) The numbers are the coefficients from the membership dummy with t-statistics in parentheses. *= statistically significant at a 90% confidence level; **=statistically significant at a 95% confidence level; ***=statistically significant at a 99% confidence level.
(3) The matching estimator contains the following covariates: age and age squared; male; white; degree; married or living as married; risk scale; occupation (7 dummies); supervisory status; hours worked (4 dummies); tenure and tenure squared; log annual wages. The monitoring estimates also control for how easy it is to see how hard your co-workers are working and how closely supervised you are in your job, both of which are coded on a (1,10) scale.
(4) Dependent variables are as follows:
- The working harder scale runs from (-10,10). It is the difference between workers' assessment of how hard they work relative to their perception of how hard co-workers work, as described in the text.
- Hours worked relative to standard contractual hours. Respondents are asked "How many hours do you work for ShareCo each week?" and to distinguish "standard hours, excluding additional time worked" and "typical hours, including overtime, working at home and weekend work". We subtract standard hours from typical hours to identify hours worked above contract.
- Days absent. Respondents are asked "how many days have you been absent from work in the last six months (excluding vacation)?" We construct a categorical absence variable which splits the continuous days measure into six categories: none, >0<=1, >1<=2, >2<=3, >3<=4, >4<=5, >5.
- Voluntary quits. The quit dummy equals 1 where the respondent expects to work at ShareCo for less than a year and says they are "not very/not at all likely" to be laid off.
- Job search. Denotes the likelihood of looking for a job with another organization in next 12 months using an ordinal scale where 1="not at all likely" to 5="very likely".
- Co-worker monitoring. Derived from the following question: "If you were to see a fellow employee not working as hard or as well as he or she should, how likely would you be to...discuss this with the employee; speak to your supervisor or manager; talk about it in a work group or team; do nothing?". Responses to the four questions were coded from "not at all likely" through to "very likely". The co-monitoring scale used is an additive scale which sums responses to the first three questions with "not very likely" scoring 1, through to "very likely" scoring 3. We subtract 3 from the scale so that it runs from zero to nine.

Table 2: Sensitivity of Member Effects on Quits and Job Search to Conditioning on Organizational Loyalty and Perceptions of Fair Pay

	Unmatched	**ATT**	**OLS**	**Fixed Effects**
1) Voluntary quits (0,1)				
- *exc. OL and FP*	-.062 (4.77)***	-.051 (2.35)**	-.048 (2.67)***	-.047 (2.48)**
- *inc. OL and FP*	-.062 (4.77)***	-.033 (1.87)*	-.027 (2.00)**	-.024 (1.68)
2) Job search, categorical (1,5)				
- *exc. OL and FP*	-.551 (8.30)***	-.441 (4.52)***	-.407 (7.11)***	-.428 (5.28)***
- *inc. OL and FP*	-.551 (8.30)***	-.306 (4.68)***	-.229 (3.96)***	-.244 (3.72)***

Notes:
(1) Rows 1 and 3 replicate the estimates presented in Table 1. Rows 2 and 4 are identical except that estimates also condition on the organizational loyalty (OL) and perceptions of fair pay (FP) scales described in footnote 12. Matching methods are as per those described in the notes to Table 2, but in this case 17 members had no common support among the non-member sample so estimates are based on N=1,046.

Table 3: Separate Estimates of Member Effects on Behaviour for Men and Women

	Unmatched	**ATT**	**OLS**	**Fixed effects**
1) How hard workers work relative to how hard other employees work (-10,10)				
- *Men*	.209 (1.52)	.059 (0.29)	.056 (0.31)	.147 (0.76)
- *Women*	.187 (1.30)	.483 (2.26)**	.468 (6.39)***	.438 (1.96)**
2) Hours worked relative to contractual hours (0,45)				
- *Men*	3.462 (6.62)***	0.670 (1.10)	0.233 (0.37)	0.717 (1.11)
- *Women*	1.492 (3.79)***	0.573 (1.22)	0.517 (1.58)	0.437 (0.77)
3) Days absent, categorical (0,6)				
- *Men*	-.564 (3.84)***	.078 (0.46)	.092 (0.73)	.055 (0.35)
- *Women*	-.733 (4.27)***	-.581 (2.50)***	-.554 (5.02)***	-.573 (2.40)**
4) Voluntary quits (0,1)				
- *Men*	-.074 (3.84)***	-.035 (1.77)*	-.040 (2.19)**	-.041 (1.89)*
- *Women*	-.053 (3.00)***	-.008 (0.60)	-.010 (0.77)	.001 (0.10)
5) Job search, categorical (1,5)				
- *Men*	-.541 (5.77)***	-.506 (3.53)***	-.499 (5.53)***	-.567 (4.26)***
-*Women*	-.582 (6.12)***	-.295 (2.60)***	-.293 (3.54)***	-.248 (2.27)**
6) Intervening with another worker who is not doing good job, additive scale (0,9)				
- *Men*	.587 (3.13)***	.251 (1.20)	.234 (0.98)	.147 (0.69)
- *Women*	-.046 (0.25)	-.264 (1.30)	-.285 (2.08)**	-.178 (0.81)

Notes:
(1) Estimates are as per Table 1 except they are run separately for men (N=529) and women (N=534). The number of members without common support was 19 or 20 among men and 9 or 11 among women.

Table 4: Effect of Perceived Plan Membership in One's Work Unit Among Plan Members and Non-members

	OLS	**Fixed Effects**
1) How hard workers work relative to how hard other employees work (-10,10)		
- *Members*	-.159 (3.87)***	-.189 (3.38)***
- *Non-members*	-.243 (3.56)***	-.264 (2.43)***
2) Hours worked relative to contractual hours (0,45)		
- *Members*	-.079 (0.40)	.043 (0.23)
- *Non-members*	-.330 (1.17)	-.184 (0.79)
3) Days absent, categorical (0,6)		
- *Members*	.083 (1.77)*	.063 (0.93)
- *Non-members*	.043 (0.87)	.054 (0.52)
4) Voluntary quits (0,1)		
- *Members*	-.007 (2.04)**	-.008 (1.17)
- *Non-members*	-.031 (2.07)**	-.041 (2.87)***
5) Job search, categorical (1,5)		
- *Members*	-.022 (0.58)	-.046 (1.24)
- *Non-members*	-.182 (2.93)***	-.226 (4.10)***
6) Intervening with another worker who is not doing good job, additive scale (0,9)		
- *Members*	.141 (2.79)***	.230 (2.79)***
- *Non-members*	.025 (0.21)	.143 (1.22)

Notes:
(1) OLS and office/business unit fixed effects models for members and non-members separately. Model specifications identical to Table 1 column except we replace individual Plan membership with employee's perception of the percentage of employees in the business unit who are members of the Plan. The categorical responses to percent membership are entered as a linear term.
(2) Members with no common support are dropped from estimates (N=19). Estimation sample N=572 for members and 472 for non-members except in model 6) for monitoring where N=575 for members. The fixed effects models absorb 33 office/business units in the case of members and 24 in the case of non-members.
(3) See Table 1 for notation and model details.

Table 5: Sensitivity of Member Treatment Effect to Variations in Explanatory Power of the Model When Delta is Set to 1

Dep Var.	Uncontrolled Effect [R^2]	Controlled Effect[R^2]	$R_{max}=e(R^2)$	$R_{max}=1.25*e(R^2)$	$R_{max}=1.5*e(R^2)$
Harder	.187 [.003]	.218 [.064]	.218	.226	.234
More hours	2.457 [.051]	.323 [.459]	.321	-.237	-.782
Absence	-.679 [.003]	-.233 [.104]	-.233	-.098	.028
Quits	-.062 [.020]	-.048 [.068]	-.048	-.043	-.038
Job search	-.540 [.058]	-.407 [.183]	-.407	-.358	-.308
Monitoring	.255 [.004]	-.043 [.216]	-.043	-.119	-.197

Notes:
(1) The left hand column contains short-hand labels for the dependent variables appearing in Tables 1, 3, and 4.
(2) Column 1 shows the raw difference between members and non-members in the whole sample prior to matching with the model r-squared in brackets. Column 2 shows the membership differential having conditioned on the variables described in footnote 3 to Table 1, replicating the estimates in column 3 of Table 1). The remaining 3 columns show the sensitivity of the membership coefficient to rescaling of the explanatory power of the model assuming throughout that observed and unobserved variables play an equal role in selection into membership ($\delta=1$).
(3) All estimates are based on models that are weighted using the propensity score weights. N=1044 except for monitoring where N=1047.

Technical Appendix

Table A1: Probit matching estimator for ESPP Membership

```
Probit regression                                 Number of obs   =       1063
                                                  LR chi2(20)     =     293.91
                                                  Prob > chi2     =     0.0000
Log likelihood = -583.18565                       Pseudo R2       =     0.2013

------------------------------------------------------------------------------
      member |      Coef.   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |  -.0494725   .0327722    -1.51   0.131    -.1137048    .0147599
       agesq |   .0008301   .0004134     2.01   0.045     .0000199    .0016403
        male |   .0602637   .0944774     0.64   0.524    -.1249085     .245436
       white |   .3163663   .1799207     1.76   0.079    -.0362719    .6690045
      degree |   .3007614   .1040676     2.89   0.004     .0967926    .5047302
     married |   .1475329   .0941969     1.57   0.117    -.0370895    .3321554
        risk |   .0192719   .0205093     0.94   0.347    -.0209257    .0594694
       djob1 |   .2283368   .3401387     0.67   0.502    -.4383227    .8949964
       djob2 |   .3193314   .2325658     1.37   0.170    -.1364893    .7751521
       djob3 |  -.2687497   .1817702    -1.48   0.139    -.6250128    .0875133
       djob5 |  -.0035179   .1484441    -0.02   0.981    -.2944629    .2874271
       djob6 |   .0518403   .1503384     0.34   0.730    -.2428176    .3464981
       djob7 |  -.1045033   .1565692    -0.67   0.504    -.4113733    .2023668
    supervis |  -.0372214   .0549729    -0.68   0.498    -.1449664    .0705235
    dhrscon1 |  -.0298652   .2405503    -0.12   0.901    -.5013351    .4416046
    dhrscon2 |   .0589078   .2020285     0.29   0.771    -.3370608    .4548764
    dhrscon3 |  -.0049955   .2137625    -0.02   0.981    -.4239623    .4139713
      tenure |   .0164067   .0015808    10.38   0.000     .0133084     .019505
       tensq |  -.0000368   5.44e-06    -6.77   0.000    -.0000475   -.0000262
     lannpay |   .4856989   .0992142     4.90   0.000     .2912426    .6801551
       _cons |  -5.411826   1.061948    -5.10   0.000    -7.493206   -3.330446
------------------------------------------------------------------------------
Note: variables are as follows: age; agesq=age squared; male; white; degree; married;
risk=risk scale; djob1=senior manager; djob2=middle manager; djob3=lower manager;
djob5=support; djob6=technical; djob7=sales; supervis=supervisory responsibilities;
dhrscon1=<35 hours;dhrscon2=35 hours; dhrscon3=>35, <40 hours; tenure=months working for
ShareCo; tensq=tenure squared; lannpay=log annual pay (£ sterling).
```

Figure A1: Common Support on ESPP Membership

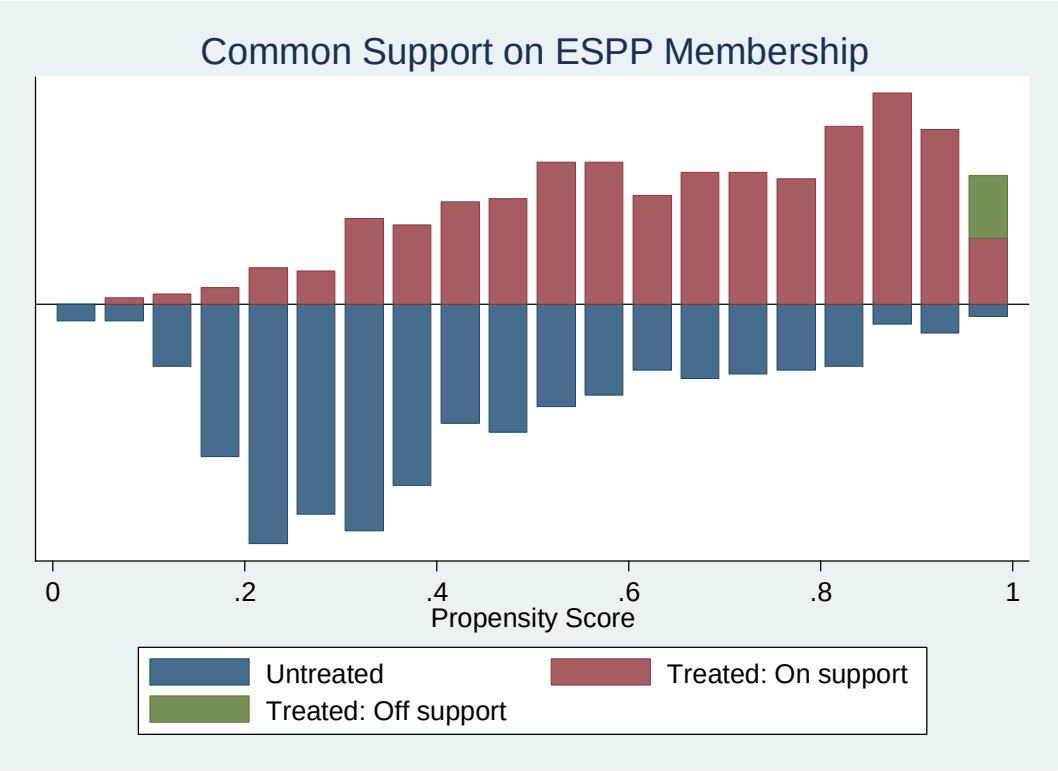

Table A2: Quality of the Match

Sample	Ps R2	LR chi2	p>chi2	MeanBias	MedBias	B	R	%Var
Unmatched	0.201	293.91	0.000	24.1	21.2	114.5*	1.38	71
Matched	0.011	17.57	0.616	4.2	3.3	24.9	1.33	14

* if B>25%, R outside [0.5; 2]