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'The Value of Rude Health': Employees' Well Being, Absence and Workplace Performance

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Abstract

This paper brings new evidence on the relationship between employees' well being, sickness absence and four dimensions of workplace performance i.e. productivity, efficiency, quality of service and profitability. It uses a new panel dataset with monthly observations over two years for 48 local units of a large multi-site organisation in the logistics sector. It finds that good consultation and communication at the local level are associated with lower absenteeism. It also finds that lower absence is associated with higher efficiency, productivity, quality of the service and profitability of the firm. Finally, the authors suggest that the link between workers' absence and this firm's profitability runs through the increased use of replacement labour which raises short-run costs and reduces quality of service.

Keywords: Time Allocation, absenteeism, Safety, Accidents, Industrial Health
JEL Classifications: J22, J28
Data: Organisational data set, confidential individual observations

1. Introduction

Absence from work due to sickness is widely believed to cost a great deal to advanced industrial economies. According to estimates from the British employer's organisation, the CBI, and the professional organisation for Human Resource Management in Britain, the CIPD, sickness absence from work costs the British economy annually between £13.4bn and £16.5bn[1]. A similar picture was painted by the British government's Black review of the health of Britain's working age population, which put the wider economic costs of ill-health in Britain at over £100bn a year. Like the CBI and the CIPD, her review stressed the role of the workplace in the nation's health, and that in addition to medical services, line managers have an essential part to play. The report stressed the mutual gains from employer action on employee sickness. 'Good line management can lead to good health, well-being and improved performance. Line managers also have a role in identifying and supporting people with health conditions to help them to carry on with their responsibilities, or adjust responsibilities where necessary' (Black, 2008 p11).

In this paper, we use a new data set which includes monthly observations on sickness absence, performance and yearly information on workforce composition and well-being for 48 depots of a major UK company, PFW, which operates in the logistics sector, for the period 2004-2008. The novelty of this dataset is that it includes detailed information on four different dimensions of workplace performance i.e. physical productivity, efficiency, quality of the service provided and profitability. Our data set also includes information from the organisation's annual employee attitude survey over the period. This provides insight into employee views about their work, their managers, the company, and the plant level communication and consultation process. Over the period, the company invested a great deal of time and resources in improved absence management, by a mixture of health and well-being policies and better monitoring by local level managers who were encouraged to 'manage not medicalise' sickness absence. The CIPD and CBI surveys show that very few organisations undertake any rigorous measurement of their absence costs, and even when they do, they tend to adopt an accounting approach without measuring the impact on productivity and profitability. We were also able to conduct a number of in-depth interviews with local depot managers and local union representatives as well as senior managers of the organisation. These interviews helped us to gain some insight on the transmission mechanism between employees' well being, sickness absence and workplace performance within PFW (see Appendices 2 and 3 for details).

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[1] Based on evidence from the Confederation of British Industry the Chartered Institute of Personnel and Development, respectively, respectively Britain's leading employer and human resource management organisations (CBI 2008, CIPD 2007)

Our analysis of detailed performance data from a single multi-site organisation sheds new light on the effects of sickness absence on organisational performance, and is a step forward compared with previous work based on large national labour force and production data sets: In the first part of the present paper we address the question whether improved absence management is associated with a reduction of workplace absence. In particular, we analyse some of the determinants of depot sickness absence rates, and the relationship with employee well-being and local management effectiveness. In the second part we examine whether lower workplace absence has an effect on firms performance. We look at the effects of absence upon depot productivity, efficiency, profitability and the quality of the service delivered. Our results show that good consultation and communication at the local level, and a supportive approach to absence management that emphasises employee well-being is associated with lower absenteeism. We also find that lower absence is associated with higher efficiency, productivity, quality of the service provided and profitability of the firm. Finally, we suggest that direct channels exist linking workers' absence to firms' profitability through the increased use of replacement labour and the reduction of the quality of service provided.

The paper is structured as follows. In the next section we review the literature on the determinants of sickness absence and workplace performance. In section 3 we briefly describe the institutional characteristics of PFW and how we constructed our dataset. Section 4 provides the empirical analysis. In section 5 we highlight possible channels through which well-being policies affect workplace performance by means of a path analysis. Section 6 concludes.

2. Some previous research on sickness absence

2.1 The causes and treatment of absence

There is now a substantial body of research indicating that the kind of policies used by PFW to improve employee health and promote more healthy life-styles are potentially beneficial to organisations. Two wide-ranging literature reviews stressed a number of fairly robust conclusions (see Luz and Green, 1997, and Harrison and Martocchio 1998). Some aspects of people's life-styles are particularly associated with higher absence rates, including smoking, heavy drinking, drug abuse, and lack of exercise. Physiological characteristics such as age are also influential. Harrison and Martocchio's review (1998) shows that among men, absence rates tend to decline with age, but for women, there is no relationship. They hypothesised that this was less connected with physiological age than with older workers having achieved a better fit between their job preferences and their current jobs, and hence to greater satisfaction.

The scope for management policies to reduce absence is also highlighted by the evidence

that adapting work schedules can assist in promoting more reliable work attendance. According to the evidence reviewed by Harrison and Martocchio, working on day shifts, having flexible work-schedules and shift patterns that fit with social routines outside work also contribute to lower absence. Outside caring responsibilities have been shown to be a major influence on work attendance. On the one hand, people with such responsibilities may also have a more responsible attitude to their work, but on the other, such attitudes may from time to time be overridden by the needs of their dependents Other research also illustrates the importance of non-work demands on work attendance (eg. Allen 1996). Action to improve a number of job-related issues is also associated with lower absence (Harrison and Martocchio, 1998). According to these authors these include high levels of job satisfaction, job involvement, and organizational commitment, doing meaningful tasks, and working in a group or a culture with strict and salient attendance norms. How the workplace is managed can also be influential. The usefulness of return-to-work interviews to reduce absence is widely supported by research evidence and managers' experience (Krause et al., 1998, and Crail, 2007), although there is variance between groups of employees, and much also depends on how managers carry them out. Likewise, the attempt to develop a more consultative, informative and supportive approach by local management accords with findings that this approach is associated with improved job satisfaction and contentment, which other studies have found to be related to lower absence (Deery et al., 1995, and Wood 2008).

Incentives and sanctions may also reduce absence and encourage attendance. Several psychologists and labour economists have used choice and utility maximisation models with some success, treating the work attendance decision as the outcome of a balance of positive and negative utilities (Harrison and Martocchio 1998, Barmby and Suzyrman, 2004). Within this framework, financial rewards for attendance, such as attendance bonuses, and experience-rated supplementary sick pay should raise the relative cost of absence for the employee, and so tip the balance in favour of attendance. Some studies suggest this is particularly relevant for the duration as opposed to the incidence of absence (Barmby et al 1991, Winkelmann, 1999).

Organisational factors can also be important, and perhaps the three most salient themes in the literature concern the effect of major organisational changes, the cost of absence to the organisation, which may vary according to its technology, and what might be called the organisation's 'absence culture'. Major organisational changes, such as restructuring at PFW, have been found to affect attendance, although the theoretical approaches lead to differing conclusions. According to one, mainly psychological, line of research employees use temporary withdrawal as a means of coping with the stressful events, such as downsizing and increased job insecurity (eg de Witte 1999). On the other hand, many labour economists would expect a period of downsizing to be associated with reduced absenteeism because employees with a reputation for absenteeism are

likely to be higher on their employer's list of those to be made redundant. In effect, such periods increase the expected cost of absence to the employee thereby inducing them to choose increased work attendance (Allen 1981, Dionne and Dostie 2007).

An organisation's technology can affect its ability to accommodate absence without harming overall performance. For example, absence is more costly for organisations with 'just-in-time' technologies than for more traditional bureaucratic models which use buffer stocks to ease adjustments. According to their situation, firms may seek to recruit employees with different propensities for absence by the design of their pay and benefit packages. For example, they might offer higher pay coupled with a strict regime on attendance, or lower pay with a more accommodating regime. This approach has been investigated, for example, by Allen (1983) and Lanfranchi and Treble (2008). It could be argued that the organisation in this case study has made just this transition, as just-in-time delivery has become a key part of competition for internet sales. This approach also has implications for the distribution of absence costs between employer and employee as part of the cost of the more accommodating benefit package is paid for by employees taking lower wages.

Many writers have argued that organisations develop 'cultures', or standards, of attendance and with a set of legitimate or tolerated reasons for absence. In their classic studies, Hill and Trist (1953 and 1955) show how such norms of mutually acceptable absence behaviour are learned by new employees as they observe both how management treats their own absences, and how it treats those of their colleagues during their first years in an organisation. Four to five years service appeared to be the relevant threshold in their study. Although there may be formal rules about absence, what matters is how management applies them in practice. Management's treatment of each case is likely to establish precedents in the eyes of other employees so that workplace norms of absence can evolve over time as part of a process of 'custom and practice' in the same way that other work standards evolve as a form of implicit negotiation as management errors of commission and omission are taken to establish new precedents (Brown 1973, Edwards and Scullion 1982). A number of studies have also provided evidence for the effects of work group cultures on absence, for example, work group cohesion can have positive or negative effects on absence depending on job satisfaction (Drago and Wooden 1992), and absence rates have been found to increase among teachers when they move to high absence schools (eg Bradley et al 2007). Aspects of the 'absence culture' thinking can be found in theories of the 'psychological contract' which stress the role of employee expectations about the 'psychological contract' governing what are mutually acceptable patterns of absence behaviour at work (Nicholson and Johns 1985). Management can influence such norms and expectations among its employees, but it cannot change them unilaterally (Conway and Briner, 2005).

Thus, the research literature strongly supports the contention that 'sickness absence' has many potential causes, not just strictly medical ones. From a policy point of view, this suggests that organisations have to apply a range of different types of policies. Promoting better health and fitness can address some purely medical causes, but dealing with absence cultures or renegotiating psychological contracts clearly involves a rather different kind of approach. It is also likely that the approach to one aspect of absence will interact with the others. For example, an emphasis on improving health may also signal to employees that their employers wish to change the psychological contract. Equally, it may be hard for an employer to change the psychological contract without emphasising the value of employee health. It may also be hard to change it without simultaneously adopting other measures to treat absence such as improved record-keeping and an active management approach to return-to-work interviews.

2.2   The effects and costs of absence

There is a long tradition of estimating the cost of absence. It ranges from what might be called the 'book' or 'accounting' cost, which computes the cost of a day's absence by adding up the cost of such items as pay, benefits, management time and replacement labour, and the 'behavioural' cost. The latter seeks to estimate the cost by taking into account behavioural relations within the organisation and in the labour market, such as those affecting productivity and the incidence of costs on different parties. The former generally uses information from surveys of absence, often carried out by management or employer organisations, such as those of the CIPD and the CBI and their sister organisations in other countries, and apply an estimate of the cost of a day's absence (e.g. Shelly, 1993). Examples of gross costs include wages and employer contributions of absent workers, replacement labour, management costs, and additional spill-over costs on other workers. Net costs would take account of the gross costs minus the productivity of the replacement labour, which may be lower than that of the person absent. Indeed, as will be seen in this study, replacement labour was believed by managers, and appeared in the statistical analysis, to be only about half as productive as regular employees. Although useful to get an idea of the overall lost production due to absence, these calculations generally make the strong assumption that 100% attendance is a realistic standard by which to judge these losses. This could be moderated if those present but sick have reduced productivity, and it is also questionable whether a zero percent absence rate would be sustainable over time, and therefore an appropriate benchmark for estimating costs (Caverley et al, 2006). Being present but at reduced productivity because of illness, 'presenteeism', is particular common for mental illness which affects large numbers of adults (Parsonage, 2007). Finally, although commonly reported as though absence is 'costing business' £x million pounds, this approach in fact gives no indication as to its division between employers in lost

production and employees in lower wages or in extra work to cover for absent colleagues.

An alternative approach used by some labour economists has been to use market valuations. Allen (1983), for example, outlines two approaches to measuring the cost of employee absences from work: one based on wages and the other on productivity. The idea behind the first is that firms for which absence costs are high will be willing to offer higher wages combined with stricter absence provisions, and those for which absence matters less can be more tolerant, but pay lower wages. In effect, the wage offered reflects the productivity that the employer expects to achieve. Allen then estimates wage equations for US industries, and finds that industries with higher absence rates pay similar workers lower wages (that is, similar in terms of such characteristics as gender, household size, age, job tenure, education and occupation). He found that a 10% point rise in the absence rate was associated with a 1.3% decrease in the wage overall, and 2.4% for production workers. This is evidence that some of the cost of absence is shared by employees.

His second approach reflects the idea that higher absence rates damage organisational performance, in this case, productivity. Using a standard production function model which links labour and capital inputs to outputs, he found that the same ten point increase in absence was associated with a 3.1% decline in industry productivity, which fell to 1.6% when controlling for industry-specific effects. Compared with the 1.3% decrease in overall wages above, this suggests that a substantial part of the overall cost of absence is shared with employees. Both sets of estimations used cross-sectional industry data for the US, and it could be argued that the real cost for business lies in the opportunity cost of absence, that is, the production plans that could not be achieved because of unreliable attendance levels.

Coles and Treble (1996), and Coles et al (2007) make a first step in this direction when exploring the implications of absence for different production technologies. What they call 'assembly line' technology requires a full complement of workers without which it cannot function. As a result, firms with this model have to hire additional workers to ensure absences are covered, which reduces average worker productivity. In contrast, what they call 'linear' production technologies make less stringent demands on attendance because output varies (linearly) according to the number of workers present. Most organisations lie in between these two extremes, but they serve to highlight how firms' technology can affect the economic cost of absence they face. In a more recent paper, Lanfranchi and Treble (2008) take this further by looking at use of buffers in order to make 'assembly line' technologies more robust to absence, but these also entail costs, as highlighted by the literature on 'lean production'. The present study takes this a step further by exploring the detailed impact of absence on various dimensions of organisational performance across different sites.

3. The organisation and its data

3.1 The organisation and its context

The company, PFW, runs a major logistics operation across the UK working with a system of national sorting centres and about 50 local depots which collect and deliver items to businesses and to homes. A large part of the workforce is engaged in collection, sorting and delivery. The sector has become much more competitive in recent years as a result of postal deregulation across the EU, and the growth of internet sales. The parent company is strongly unionised and parts of it have long a tradition of robust industrial relations.

Between 2002 and 2004 PFW underwent a major transformation, staunching its severe financial losses, and rescaling and restructuring its operations towards a smaller number of higher value-added delivery services. By 2004, the beginning of the period of observation, it had cut its workforce by two-thirds, and closed over half of its local depots, and by 2005-06, it returned a modest, but rising, profit. In the process, it moved towards greatly improved financial health, establishing a platform from which it could compete in the increasingly deregulated market for delivery services.

However, the move towards greater efficiency and better financial health achieved by the end of its 'Project Apollo' was believed to lack sustainability because employee morale was low, and sickness absence rates were very high, the figure for the whole company being around 7% through much of 2004. At the time, the CBI and CIPD employer surveys of absence were reporting absence rates nationally of about 3-4%.

3.2 The data

Working closely with the organisation, we were able to construct a panel data set comprising monthly series for each depot on sickness absence rates, replacement labour, physical productivity, unit costs, a measure of profitability, and delivery quality of service. The company provided also information by depot from its annual employee attitude 'Have Your Say' (HYS) survey. This gave us information on employees' views related to their jobs, their managers, the company as a whole, and the effectiveness of the local communication and consultation procedures 'work time listening and learning', WTL. We were also given annual figures on the composition of each depot's workforce, notably its gender, age and length of service mix. Additional information on the state of depots' local labour markets, local unemployment rates and local median pay, has been added in using data from the Office for National Statistics (ONS) on employee earnings and local unemployment rates. The earnings data are for the year, and the unemployment data are monthly.

The ONS monthly index of national non-store retail sales, a large part of which relates to online sales, is used as a proxy measure for the level of demand for the sector's delivery services (Appendix Table A1 includes the complete list of our variables of interest with their means and standard deviations).

Absence rates are based on the total hours of reported sickness absence in depots for the period divided by the total number of contracted hours adjusted for holiday entitlements (*SICK*). Replacement labour is provided in the form of monthly numbers of agency workers used by the depot (*AGENCY*). Productivity is measured in daily items delivered per full time equivalent employee (*ITEMS*). Unit costs comprise direct employment and operating costs (*UC*). Profitability is measured by operating net income which relates to revenue earned from the depot's collection and delivery operations, minus direct and indirect costs (*PROF*).[2] Quality of service relates to the percentage of items delivered on time (*QS*). The measures underlying these indicators are used as part of the organisation's management accounting system and provide the basis for the performance targets set periodically for each depot. Targets are agreed between central and local management and revised to take account of changing local circumstances. They are used very much as a discipline for local managers who would be called to account if targets were missed, and whose bonuses contained an element related to their targets. They also have the distinct methodological advantage to factor out a number of influences on local performance that were recognised by central and local management but which could not be measured statistically. As we see later in detail, we use the gap between the actual values and their target values as our main performance measures. Where appropriate, all the indicators were normalised on a daily basis because of variation in the number of working days in calendar months.

The HYS survey of employees' attitudes is our source of indicators of employee opinions about their jobs, their managers, their company, the consultation process and social facilities at work, and has a response rate of 60-70% during the period of observation. The survey is carried out annually on a rotating basis across depots during the year. For our purposes, it comprises about 50 questions, most of which ask respondents to give their opinions on Likert scales. Our measures of employees' opinions on these issues were made available to us in aggregated form at depot level, and we ran a factor analysis to condense the replies into five indexes relating to employees views about their job, their manager, the company, its social facilities, and the quality of the weekly work-time listening and learning sessions. The "My job" index includes such questions as the quality of team relations, whether employees have the necessary skills, shared responsibility for safety and helping out and indicates how happy workers are about their jobs. The "My manager" index

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[2]   Total revenue in this case excludes revenue paid centrally for certain major national contracts, and which is not attributed to individual depots. On the other hand, locally generated business is included in depot revenue.

includes such questions as fair treatment, influence on decisions, support from and approachability of management, management care about health and well-being and expresses workers' judgement about the quality of relations with their line managers and whether they feel they are supportive. The "My company" index includes such questions as communication of information about the company, organisational changes, and the bonus system, confidence in management's leadership and its honesty; it reflects views about the perceived quality and trustworthiness of senor management. The "WTL" index measures the frequency of WTL sessions attended, improvements made as a result of issues raised in WTL and HYS, use of local budget to fix problems, and if well-informed about depot performance. It provides a judgement about the experiences with management communication and consultation. Finally the "Social" index measures whether social facilities are good within the workplace.

For our analysis, we focus primarily on the financial years of 2005 and 2006. We have some data for 2004 and earlier, but were advised that its quality was not as good. As part of the company's restructuring, it had sought to build a more effective statistical system with comparable data for each depot so that it could benchmark performance. It is also likely that the treatment of long-term and short-term absence changed during 2004.[3] This causes a break in the series at the end of 2004-05, but should not greatly affect month-to-month variability on either side of this date. We therefore use the earlier data mainly as a check on the robustness of our estimations for 2005-06 and 2006-07. We also limit the analysis to observations where the monthly sickness absence rate is below 25%. This leaves us with over 950 observations for about 45 depots in the two-year period.

4. Descriptive statistics

4.1 Did employees benefit from the absence and well-being policies? Trends in sickness absence in the company 2003-2008 and evolution of HYS scores over time

Chart 1 shows the trend in sickness absence at PFW from the April 2003 up to March 2008 (*pfw abs*). The upper thick line traces the fall in absence rates, and shows that rates fell from around 6.5-7% in 2003 and 2004, through 5% in 2005 and touching 4% in 2006. Thereafter they have fluctuated around 4-5% and appear to have levelled off at around 4.5% through 2007-08. It is interesting to note that a similar trend is registered for the usage of agency workers by PFW. This in fact decreases on average between 2004 and 2007 (Appendix Chart A1). Because sickness absence has a strong seasonal element, and can be affected by national sickness and economic factors, we

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[3]   Before then, most depots had counted only paid periods of sick absence. Employees on long-term sick leave for six to twelve months would have been on half pay, the rest coming from the sick pay fund, and so would have counted as half an absence. Those absent for twelve months or more would have been paid entirely from the sick pay fund, and have disappeared from the absence figures.

show also monthly figures for sickness absence from the Labour Force Survey (*lfs abs wt*). The concepts are not directly comparable in a way that affects levels but not trends, (see the note beneath Chart 1). We also regressed the organisation's absence rate on the national figure using year and month dummies to capture time and seasonal effects. The predicted absence figure (*pfwabs_pred)* and the residuals (pfwabs_res) are also shown. The coefficients on the year dummies show an improvement by 2007 of about two and half points on the 2003 figure.

As mentioned earlier, the period of our study saw a major effort by the company to improve its absence management in order to reduce its high absence rates. Chart 2 shows the same PFW absence rates, but with the timing of major attendance and well-being policies superimposed. The thick red lines show the start of major policy initiatives such as the launch of the 'Absence to Attendance' programme in autumn 2004, which focused on reinvigorating the one-to-one return-to-work interviews across the whole organisation and revitalising sickness reporting. The thin black lines represent the start of other, important but less far-reaching, policies. As can be seen, the major policy initiatives appear at times of significantly higher levels of absence, and are followed by a noticeable decline, suggesting an initial impact as they are rolled out, but also the need to keep up the pressure on attendance once they are in place. The smaller-scale policies appear fairly regularly over time, but there is a notable cluster of measures between the autumn of 2006 and early 2007 as absence levels appeared to rise again, before settling down again in 2007-08.

Although it would be analytically tidy to draw a sharp distinction between policies aimed at employee health and well-being and those aimed at improved attendance management, in practice, the depot managers we interviewed saw them as complements to each other. They stressed that work-related issues, such as harassment, difficult work schedules, and conflict with domestic pressures, which may both contribute to poor health and attendance, could often be addressed by relatively small adjustments by either party. To take the appropriate actions, local management needs the knowledge, and this is best obtained, in their view, through the return-to-work interviews and job level consultation and communication. The company's health and well-being programmes provided resources local management could draw upon to address issues raised in the return-to-work interviews. Thus, the same channels that might be associated with closer absence monitoring, are also essential to the kind of direct contact with individual employees to tackle underlying causes of absence.

Table 1 presents aggregate figures drawn from the key questions contained in the HYS questionnaire which relate to employees' well being within the workplace in the three years for which we have complete surveys. Given the good response rates, 60-70%, one can treat the results as fairly representative. Although the data available to us relate only to responses aggregated by depot, it is possible to assess how far overall attitudes to the company and its management are positive or negative. The overall results show that 68-75% of employees felt positively about their jobs, and broadly similar percentages were proud to work for the company, and wanted to continue working for it. Likewise, views were similarly positive about feeling fairly treated and enjoying work with their team. The one weak response in the table related to feeling valued by the company, which is comparatively lower than the others.

The operations managers interviewed stressed the importance of the blend of stick and carrot in the organisation's absence and well-being policies. It is hard to judge precisely which is the more important, and therefore how far improved attendance was due to improved absence monitoring and how far it was due to employee well-being including improved dialogue, mutual support and understanding within the workplace. If employees felt management was relying on the 'big stick', increased monitoring and discipline, then it is likely that attitudes would be negative. If on the other hand, they felt that management was approaching the question fairly, and adopting a supportive attitude, as described by some of the depot managers interviewed, then one would expect attitudes to be more positive. It is interesting to note in Table 1 that the share of affirmative answers to the key questions increases over time of percentages that range between 6 and 10 points. This observation suggests that employees well-being increased over time within the workplace and gives some ground to the latter interpretation i.e. the view that organisation's policies have worked more by improving employees' well-being rather than increasing monitoring within the workplace.[4]

4.2 Depot sickness absence and performance variables

Our analysis of sickness absence uses variations in absence rates between depots over time. Several studies of sickness absence observed that absence rates appeared to vary significantly between workplaces. A notable feature of the reduction in absence rates at PFW has been the improvement among the 'worst performers', as shown in Chart 3, which plots depot absence rates over time by

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[4]   Because the results also feed into local managers' performance criteria, one could imagine that discontented employees would be motivated to respond rather than be apathetic, although we have no direct evidence on this.

deciles (similar trends are experienced by workplace performance indicators; see Appendix Chart A2).

Another notable feature is that when depots experience high rates of sickness absence, they often last for several months. In other words, depot absence rates often do not reflect the random impact of short-term epidemics, but rather, something more systemic in the workplace environment. The same is true of the other performance variables we use in this study. Chart 4 shows the month-on-month correlations between depot sickness rates, and although these decline over time, it is clear that if a depot has a high rate in month 1, the trace of this does not disappear until four or five months later. Other performance variables show a similar slow rate of convergence towards the mean. Of these, the ability to deliver on time (quality of service), and profitability seem to show the most stable rank orders between depots. An analysis of the correlation coefficients between our variables of interest reveals a negative correlation of sick absence with productivity (-0,08), quality of service (-0,16) and profitability (-0,08) and a positive correlation of sick absence with unit costs (0,05; the full correlation matrix is in Appendix Table A2).

5. Empirical analysis

5.1 Empirical strategy

In line with our motivation, our empirical strategy is two fold. We first analyse the effect of absence management and well being policies on sick absence; after that, we investigate the role of absence as a determinant of organisational performance.

We start by estimating the following model:

$$SICK_{jmy} = \beta_{jy}\,X_{jy} + Z'\gamma + \alpha_j + \delta_m + \delta_y + u_{imy}; \qquad\qquad (1)$$

Here X_{jy} are the indicators for employee well being within the firm j in year y, Z is a vector of controls for labour and product market outcomes (local unemployment rate, median income, index of non store sales in the depot's district). α_j, are depot dummies while δ_m and δ_y are time dummies

(for month and year, respectively). We run equation (1) by simple OLS.[5]

The next step of our analysis is to explore the effects of sickness absence on organisational performance. We estimate the following model using OLS:

$$Y_{jmy} = \eta_{jmy}\, SICK_{jmy} + X^{'}\varphi + Z^{'}\lambda + \alpha_j + \delta_m + \delta_y + v_{imy,} \qquad (2)$$

where Y_{jmy} is our indicator of performance (i.e. $Y= ITEMS, UC, QS, PROF$) in depot j, year y and month m. We start by estimating equation (2) using as a dependent variable the actual values of Y. These estimates however are likely to be biased due to the fact that observed value of each performance indicator also depends on the target values of the variable itself which are set by the management on the basis of the characteristics of the depot and the time period. Because of the way these targets are set, they take account of a number of important factors not measured in our data. To control for this we also estimate equation (2) using as dependent variables our performance indicators in their deviation from target values.[6]

Finally, we refine the model by integrating the use of replacement labour. In a market that is increasingly dominated by timed-delivery, an organisation needs agency workers to meet its obligations if it is short-staffed owing to sickness absence. One could expect the use of replacement labour to be both less effective and more costly than regular employees.[7] On the other hand, agency staff do not have to be employed when there is no work for them.

To take account of the intervening effect of agency use between sickness absence and performance outcomes, we estimate the following system:

$$Y_{jmy} = \rho_{jmy}\, AGENCY_{jmy} + X^{'}\rho + Z^{'}\varphi + \alpha_j + \delta_m + \delta_y + v_{imy}; \qquad (3)$$

$$AGENCY_{jmy} = \chi_{jmy}\, SICK_{jmy} + X^{'}\psi + Z^{'}\kappa + \alpha_j + \delta_m + \delta_y + \zeta_{imy}; \qquad (4)$$

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[5]   In Appendix 2 we investigate further the relation between workers well-being and absenteeism by describing the possible determinants of well being within the workplace which emerged by the interviews with the operations managers and hypothesizing some transmission mechanism to absence.

[6]   These targets are set and regularly adjusted in consultation between the central management of PFW and the local depots' management. They are intended to take account of factors affecting performance that are outside local management control, such as location and the age of premises. Some of these depot specific factors could change over time, and so not be reflected in the fixed effects (e.g. major new investment or major changes in the state of local roads). Targets are also an important dimension of business performance in their own right as they play a key role in business coordination. Hence, this analysis would also capture the disruptive effect of variations in absence on performance.

[7]   This idea seems to be confirmed by the interviews we had with depot managers. Their general complaint was that agency staff were less effective than their regular employees as they often lacked detailed knowledge of delivery routes, acquaintance with customers' staff which could be especially important for collections. Managers seem to consider their regular drivers as the 'eyes and the ears' of his business, and important for building good relationships with customers. They would seldom use an agency driver for an important customer. Moreover notice that the use of agency staff was charged to depots at a rate about a fifth higher than the cost of pay and benefits for their regular employees.

Where *AGENCY*$_{jmy}$ is the number of agency workers employed by depot j in year y and month m. As before, *Y*$_{jmy}$ is our indicator of performance. The system composed by (4) and (5) aims at investigating the existence of an indirect channel through which absence may affect organisational performance. We estimate it by Seemingly Unrelated Regression (SURE) thus allowing standard errors being correlated across specifications.[8]

5.2 Results

Table 2 shows the OLS estimates of the relationship between sickness absence and five measures (factors) of employee views related to their well-being at work: their manager, their company, their jobs, workplace consultation, and workplace social facilities. In columns [1] to [5] we include each indicator of well being separately while in column [6] we introduce all the indicators in the same regression. All regressions also include a number of other variables relating to the state of the labour market (local unemployment and local median pay) and product demand (non-store sales) at the district level, and a selection of workforce characteristics likely to capture the effects of domestic pressures, and the employee's integration into the workforce.

Employee perceptions of supportiveness of their managers, their company, and of workplace social facilities exert a weak or non-significant influence on depot absence rates (Table 2, columns [1], [2] and [5]). Good team-level consultation and communication with line managers is associated with lower absence levels (column [4]). It was suggested earlier that this is likely to be correlated with effective attendance management in depots (see Appendix 1 for a more detailed analysis of the relation between sickness absence and WTL based on a model derived from our interviews with the managers). Conversely, a favourable judgement about their jobs is positively related to absenteeism (column [3]). Although surprising at a first sight, this result may reflect how accommodating, and possibly indulgent, their managers are with regard to attendance.

Finally, all the estimates show that a higher local unemployment rate is associated with lower depot absence rates. This can to be interpreted as reduced local employment opportunities causing employees to value their current jobs more highly and so provide better attendance and higher effort. Conversely a higher local median pay improves the outside options for workers, thus being associated to higher absence. Non-store sales indicate the level of product demand in the sector, which puts pressure on workloads thus contributing to fatigue and absenteeism[9]. Size and

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[8]   On the basis of the interviews we had with line managers within PFW, in Appendix 3 we develop a model which describes how the increased reliance on agency workers implied by sickness absence reduces productivity and quality of service and, accordingly, firms efficiency and profitability.

[9]   Several of the managers we interviewed recognised that the work was physically demanding, and people got tired and were likely to fall sick after periods of prolonged overtime working.

significance of the coefficients is not altered when we add all the indicators in the same regression (column [6]).

In Table 3, we report the results from the estimates of equation (2) on the actual level of ITEMS, UC, QS and PROF. SICK shows a negative impact on ITEMS and QS which is significant at the 5% level (Table 3, columns [1] and [3]). The coefficients for the impact of SICK on UC and PROF also take the expected signs but are not significant (columns [2] and [4]. Notice also that employees' well being does not seem to exert any significant positive impact on workplace performance once we account directly for the impact of sick absence.

As explained before, however, estimates reported in Table 3 may be biased as the target values set by the management for each indicator change across depots and over time. To correct this bias, we estimate equation (2) on our performance indicators taken as variances of the actual values from their target. Table 4 reports the results. Compared to the estimates on actual values, the impact of absence on performance indicators is now more significant (always between 1% and 5%): a one percentage point rise in a depot's sickness absence is associated with an additional shortfall on the productivity target of -0.15 items delivered per person per day, and it pushes unit costs an additional £0.01 over cost targets per item delivered. It moreover reduces of the 0,7% the percentage of items delivered on time and of around £2 per day the net income produced on average by each depot.

We suggested before that sick absence may also indirectly affect organisational performance via the implied use of replacement labour. Table 5 presents the results of four sets of estimates from the system composed by equations (3) and (4) above on ITEMS, UC, QS, and PROF. We estimate each set by "Seemingly Unrelated Regressions" to allow the standard errors to be correlated across the two equations in the system. These estimates give some support to our theoretical priors: variations in sickness absence have a direct impact on the use of replacement labour, a one point rise in sickness absence leading to an increase of 1.3 agency workers which is significant at the 1% on all

our indicators of performance.[10] The increased agency use has the anticipated effect on performance: raising unit costs, and reducing productivity, quality of service and profitability. Coefficients are again significant at the 1%.[11]

Before concluding, we provide a simple visual presentation of our empirical findings showing the channels through which management policies aimed at increasing workers' well being and reducing absence may lead to improved workplace performance. While it is clearly beyond the scope of the present paper to provide a comprehensive analysis of such mechanisms, in Chart 5 we use a simple path analysis[12] to sketch out a possible model for the impact of improved absence management and communication on business performance. This is based largely on our interviews with operations managers of PFW, but it also reflects a number of the points emerging from the regression analysis in this paper.. Path coefficients scale each variable in terms of its standard deviation. This is analogous to seeing whether the best performing depots in terms of WTL will have the lowest absence rates and the best quality of service. The chart expresses visually the same relationships noted earlier, for example, that absence rates have a rather weak direct effect on business performance outcomes, and that their main effect is through use of replacement agency labour.

6. Conclusions

This paper has explored the potential gains for one organisation that derive from reducing absenteeism by improved absence management supported by employee health and well-being policies. We used a new data set which includes monthly observations on sickness absence, workplace performance and yearly information on workforce composition and well-being for a company which operates in the logistics sector, for the period 2004-2008. Due to the level of detail of the data, we are able to look at four complementary dimensions of workplace performance i.e. its

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[10]   For an average-sized depot, a 1% point increase in the absence rate equates to an increase in 0.6 people absent, implying a replacement ratio of about two agency staff for one absent regular staff (1.3/0.6). Notice that this figure corresponds exactly to what the depot managers told us about the relative productivity of regular workers.

[11]   In annual terms, across the organisation's 48 depots, on these estimates, a one point increase in sickness absence would translate roughly into a drop in productivity of 22k items delivered, increased costs of £207k, and a reduction of net income of about £300k.

[12]   Path analysis expresses the relationships between the variables as standardised 'path coefficients' so one may compare the relationships between the different variables. Full details are provided in Appendix 2

productivity, efficiency, the quality of the service provided and profitability. Our results show that good consultation and communication is associated with lower absence and higher efficiency, productivity, quality of the service provided and profitability of the firm. We also suggested that an indirect channel exists which links workers' absence to firms' profitability through the increased use of replacement labour and the reduction of the quality of service provided.

The interpretation we want to give of our results is that the improved recording of absence and systematic one-to-one interviews and follow up of work absences has improved management's 'procedural grip' (to use the words of one central manager), on the problem. However, in the view of the PFW depot managers interviewed, this management of absence was facilitated by the give-and-take facilitated by the well-being policies that supported it. We believe that the present analysis, due to the excellent data provided to us by the organisation, and the time that managers gave for the in-depth interviews, provides the basis for a significant step forward in the analysis of the effects of absence and absence policies on organisational performance. It has made it possible to adopt a behavioural rather than an accounting approach to estimating the adverse costs of sickness absence, and this is a significant advance on studies using national labour force and production data. The availability of the performance targets which are used by central and local management has made it possible to open up an new area for analysis: the effects of the inherent variability in absence on the coordination of activity within a complex business. It has been possible to examine, albeit indirectly, the impact of local management quality and local implementation of the policies, and the availability of employee attitude information has made it possible to distinguish the 'fear' from the 'give-and-take' approach.

Inevitably many questions remain. PFW is not a 'representative firm' and this affects how far one may generalise to other organisations. The importance of just-in-time delivery, although spreading across organisations, is not yet the general rule, and it may never be. The workforce is predominantly male at a time when women make up nearly half of the national workforce. On the other hand, the workforce in PFW is skilled but not highly educated, and so is rather like that in many other UK organisations. Moreover, their basic earnings are close to those of other drivers reported in the ONS annual statistics on hours and earnings. As the CIPD (2008) observed, when presenting its annual absence survey, such policies as those use by PFW are not rocket science, but a blend of systematic use of absence procedures, improved communication between staff and management, and supported by employee well-being policies. The same CIPD survey showed that a great many UK organisations do not have a systematic approach to employee attendance, so the potential to benefit from the PFW experience appears considerable.

The main limitation of the present analysis is the lack of monthly observations for the indicators of well-being (available only on yearly basis) and of individual information on workers'

characteristics within the firm. It would be very interesting to collect such information (of course subject to availability) and investigate more in detail the individual determinants of absenteeism within the workplace and how these affect organisational performance.

7. Main Text Tables

Table 1. Employee judgements about their organisation 2004-2007.

Q no	Question	2004/05	2005/06	2006/07
		%	%	%
2	I enjoy my job	68	75	75
57	I am proud to work for my company	59	70	70
49	I would like to be working for my company in 12 months time	71	80	80
56	I feel my company values me	36	43	43
14	My line manager treats me fairly and with respect	65	72	73
29	I enjoy working with my team	63	69	69

Unweighted average scores across depots.

Table 2. OLS estimates of the relationship between sickness absence and measures of employee evaluations of their workplace, workforce characteristics and market pressures.

Dependent variable – SICK	[1]		[2]		[3]		[4]		[5]		[6]	
Good manager	-0.052										0.063	
	[0,166]										[0,175]	
Good Company			-0.31								-0.321	
			[0,202]								[0,248]	
Good job					0.414	****					0.441	****
					[0,135]						[0,143]	
Good WTL							-0.493	****			-0.390	**
							[0,182]				[0,194]	
Good Social facilities									-0.179		0.049	
									[0,161]		[0,188]	
Non-store sales	0.041	*	0.041	*	0.043	*	0.039		0.041	*	0.041	*
	[0,024]		[0,024]		[0,024]		[0,024]		[0,024]		[0,024]	
Local unemployment %	-0.872	****	-0.76	****	-1.094	****	-0.771	****	-0.928	****	-0.890	****
	[0,195]		[0,205]		[0,197]		[0,191]		[0,190]		[0,226]	
Median local pay	0.572		0.548		0.823	*	0.306		0.62		0.592	
	[0,484]		[0,483]		[0,488]		[0,491]		[0,485]		[0,501]	
Controls for workforce composition[1]	Y		Y		Y		Y		Y		Y	
Depot dummies	Y		Y		Y		Y		Y		Y	
Year, month dummies	Y		Y		Y		Y		Y		Y	
R2 (adj)	0.4017		0.4032		0.4078		0.4065		0.4025		0.45	
N	967		967		967		967		967		967	

Robust standard errors in squared brackets: **** <1%, *** <2%, **<5%, * <10%.
1 include % of women, prime age workers, part time workers,workers with tenure less than 5 years.

Table 3. Impact of sickness absence on depot performance
(OLS estimates on actual values of performance indicators: 2005/06 and 2006/07).

Dep variable	[1] ITEMS		[2] UC		[3] QS		[4] PROF	
SICK	-0.11	**	0.009		-0.068	**	-0.601	
	[0,048]		[0,007]		[0,033]		[0,750]	
Good manager	-0.321		0.043	***	-0.217		-1.035	
	[0,222]		[0,017]		[0,186]		[4,158]	
Good company	-0.001		-0.043		0.381		-1.071	
	[0,432]		[0,053]		[0,245]		[7,380]	
Good job	0.149		-0.012		0.015		1.323	
	[0,152]		[0,014]		[0,139]		[3,991]	
Good WTL	-0.134		0.057		-0.106		8.616	
	[0,365]		[0,051]		[0,201]		[6,590]	
Good social facilities	0.251		0		-0.404	**	-23.58	****
	[0,230]		[0,021]		[0,181]		[6,950]	
UK non-store sales	0.624	****	-0.01		-0.204	****	1.755	****
	[0,040]		[0,007]		[0,018]		[0,636]	
Median pay	-0.868	*	-0.001		-0.806	*	6.228	
	[0,491]		[0,089]		[0,406]		[11,917]	
Urate	-0.39		0.016		0.37		0.596	
	[0,255]		[0,030]		[0,226]		[5,327]	
Controls for workforce composition[1]	Y		Y		Y		Y	
Depot dummies	Y		Y		Y		Y	
Year, month dummies	Y		Y		Y		Y	
R2	0.8612		0.6691		0.9014		0.862	
N	952		960		949		955	

Clustered standard errors at the depot level in squared brackets
**** <1%, *** <2%, **<5%, * <10%.
1 include % of women, age and tenure composition, part time workers, temporary workers.

Table 4. Impact of sickness absence on depot performance
(OLS estimates on gaps between actual and target outcomes: 2005/06 and 2006/07).

Dep variable	[1] ITEMS		[2] UC		[3] QS		[4] PROF	
SICK	-0.152	***	0.01	**	-0.075	**	-1.658	****
	[0,061]		[0,005]		[0,036]		[0,548]	
Good manager	-0.879		0.05		-0.25		-24.709	****
	[0,703]		[0,032]		[0,206]		[4,261]	
Good company	0.277		-0.01		0.212		-2.134	
	[1,115]		[0,050]		[0,254]		[6,557]	
Good job	0.563		0.01		-0.123		8.241	**
	[0,758]		[0,028]		[0,159]		[3,698]	
Good WTL	0.319		-0.03		0.262		3.495	
	[0,838]		[0,043]		[0,235]		[4,926]	
Good social facilities	-0.699		0.05		-0.635	****	2.241	
	[0,548]		[0,035]		[0,218]		[5,628]	
Median pay	0.464		-0.02		1.697	**	28.448	*
	[2,213]		[0,143]		[0,759]		[15,516]	
Urate	0.747		-0.1	**	0.562	**	3.781	
	[0,818]		[0,046]		[0,245]		[8,630]	
Controls for workforce composition[1]	Y		Y		Y		Y	
Depot dummies	Y		Y		Y		Y	
Year, month dummies	Y		Y		Y		Y	
R2	0.5361		0.4514		0.8933		0.3343	
N	952		960		909		955	

Clustered standard errors at the depot level in squared brackets
**** <1%, *** <2%, **<5%, * <10%.
1 include % of women, age and tenure composition, part time workers, temporary workers.

Table 5. Sick absence, agency replacement labour and organisational performance (SURE estimates, 2005/2006 and 2006/2007).

Dep var:	[1] AGENCY	ITEMS	[2] AGENCY	UC	[3] AGENCY	QS	[4] AGENCY	PROF
AGENCY		-0 **** [0,006]		0.005 **** [0,001]		-0.042 **** [0,004]		-0.347 **** [0,089]
Sick absence rate (%)	1.28 **** [0,221]		1.333 **** [0,221]		1.317 **** [0,224]		1.326 **** [0,222]	
'My manager' good	-2.29 * [1,303]		-2.1 [1,308]		-2.19 [1,356]		-2.116 [1,309]	
'My company' good	2.89 [1,805]		2.269 [1,805]		2.269 [1,829]		2.614 [1,816]	
'My job' good	0.18 [1,033]		0.397 [1,037]		0.559 [1,056]		0.3 [1,038]	
'WTL' good	1.47 [1,394]		1.557 [1,397]		1.267 [1,460]		1.55 [1,401]	
'Social facilities' good	-1.1 [1,488]		-1.086 [1,495]		-1.06 [1,535]		-1.285 [1,495]	
UK non-store sales		0.64 **** [0,030]		-0.017 **** [0,003]		-0.14 **** [0,02]		2.233 **** [0,449]
Local labour market conditions[1]	Y	N	Y	N	Y	N	Y	N
Controls for workforce composition[2]	Y	N	Y	N	Y	N	Y	N
Depot dummies	Y	Y	Y	Y	Y	Y	Y	Y
Year, month dummies	Y	Y	Y	Y	Y	Y	Y	Y
R2	0.859	0.581	0.578	0.68	0.577	0.905	0.576	0.852
N	942	942	949	949	937	937	945	945

Robust standard errors in brackets: **** <1%, *** <2%, **<5%, * <10%.

1 local unemployment rate and local median pay

2 include % of women, age and tenure composition, part time workers, temporary workers.

Main Text Charts

Chart 1. Sickness absence by monthly reporting period 2003-2008.
The vertical bars show April of each year.
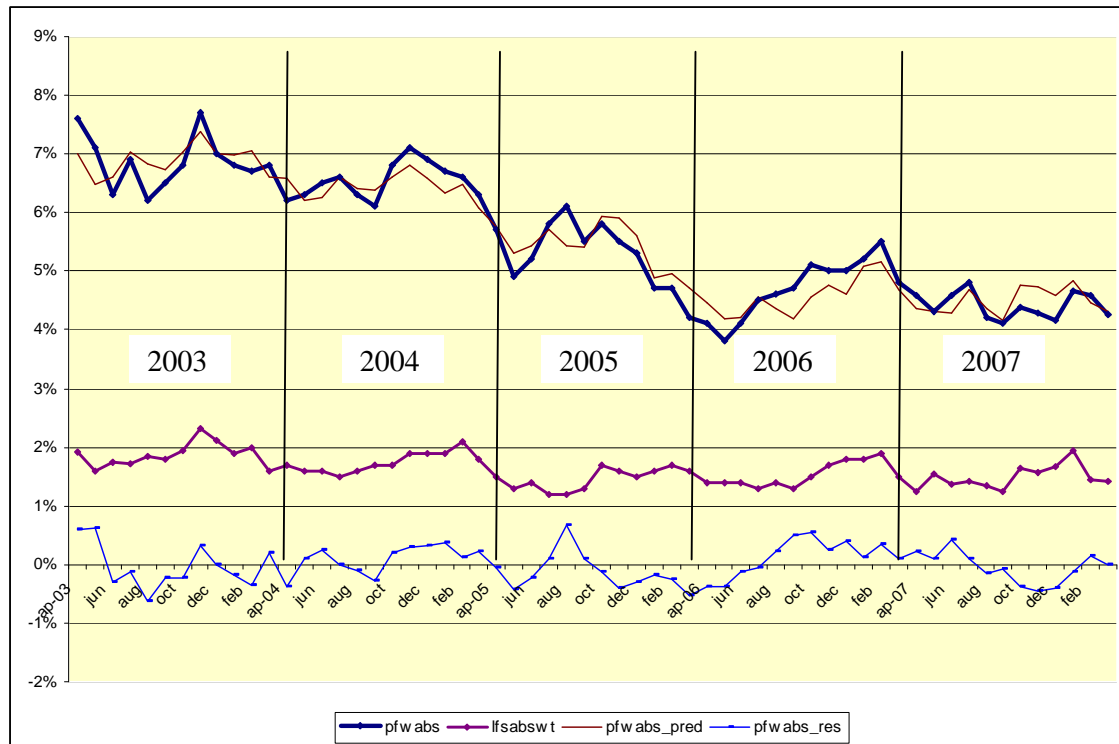
Note: The thick upper line shows the rate (%) of sickness absence at PFW based on hours of absence divided by total contracted hours, adjusted for annual leave entitlements. The lower thick purple line shows days' absence in the past week for all employees from the national Labour Force Survey, based on self-reports by respondents. The difference of concept means that the levels are not comparable. The upper thin dashed line shows the rates of PFW absence predicted from a regression analysis including time and depot dummies and the national absence figure. This removes the effect of any national level absence factors from the PFW figure. The lower thin line plots the regression residuals. The years shown are fiscal years from April to March. Sources: PFW and the British Labour Force Survey.

Chart 2. Incidence of major well-being and absence policies plotted on absence rates 2003-2007

2004- Relaunch of quarterly Area H&S Committees and local H&S forums

Launch of Absence to attendance programme: performance managing individual absence etc

RMG HELP line

All managers attend safety for PFW managers workshop

2005-2006, Project Freedom (devolving decision making and accountability to most local level).

Local joint CSR inspection

Rehab pilot to PFW London employees

free Benenden Mutual Health care for all PFW

Group Stress policy

Revised H&S policy

Local charges for new personal injury compensation

Risk Assessment and SSoW processes

Managers H&S responsibility wall charts and wallet cards

National PFW health and safety steering group

Trial employee health checks at London Central,

1st National Community Team challenge day

Issue of Haynes Smoking, stress and Nutrition manuals

PFW BACK Pack

Launch of annual CSR Audit in PFW

All managers attended safety for PFW managers 1 day workshop

On site health checks for 1500

Sick absence rates (%)

Chart 3. Monthly sick absence rate (%) figures by depot
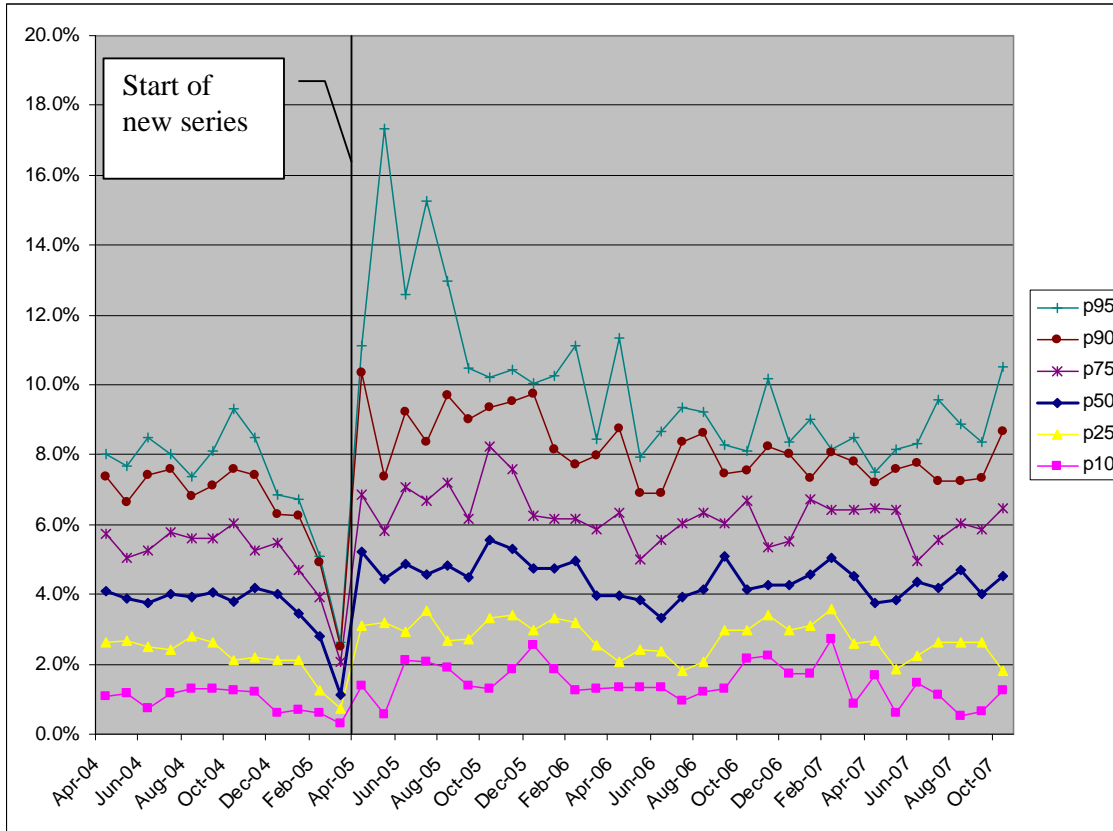
Note: absence rates (%) by depot. Rates of greater than 25% were excluded on the grounds of likely recording errors. With data for about 45 depots, the bottom 10% represent 4 depots.

Chart 4. The persistence of absence rates and other KPI scores over time
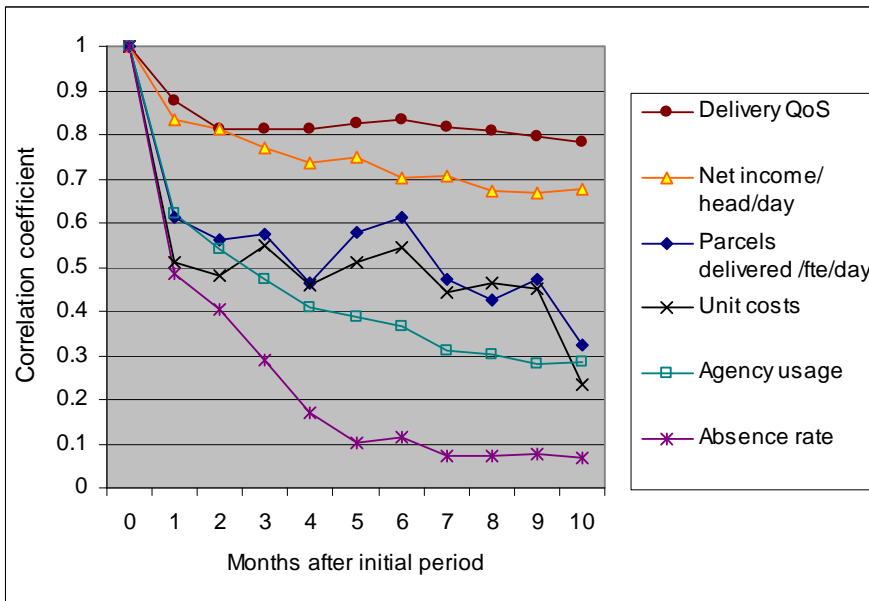
Chart 5: the relationship between improved absence management and WTL and improved profitability and unit costs (beta coefficients)
(Unit cost coefficients shown in parentheses)

All beta coefficients are significant at the 1% level, except agency use on productivity, significant at the 2% level. Depot, year and month dummies used throughout.

8. Appendix Charts and Tables

Table A1: Means and standard deviations of main variables (2005/06-2006/07): company's items relate to monthly figures by depot.

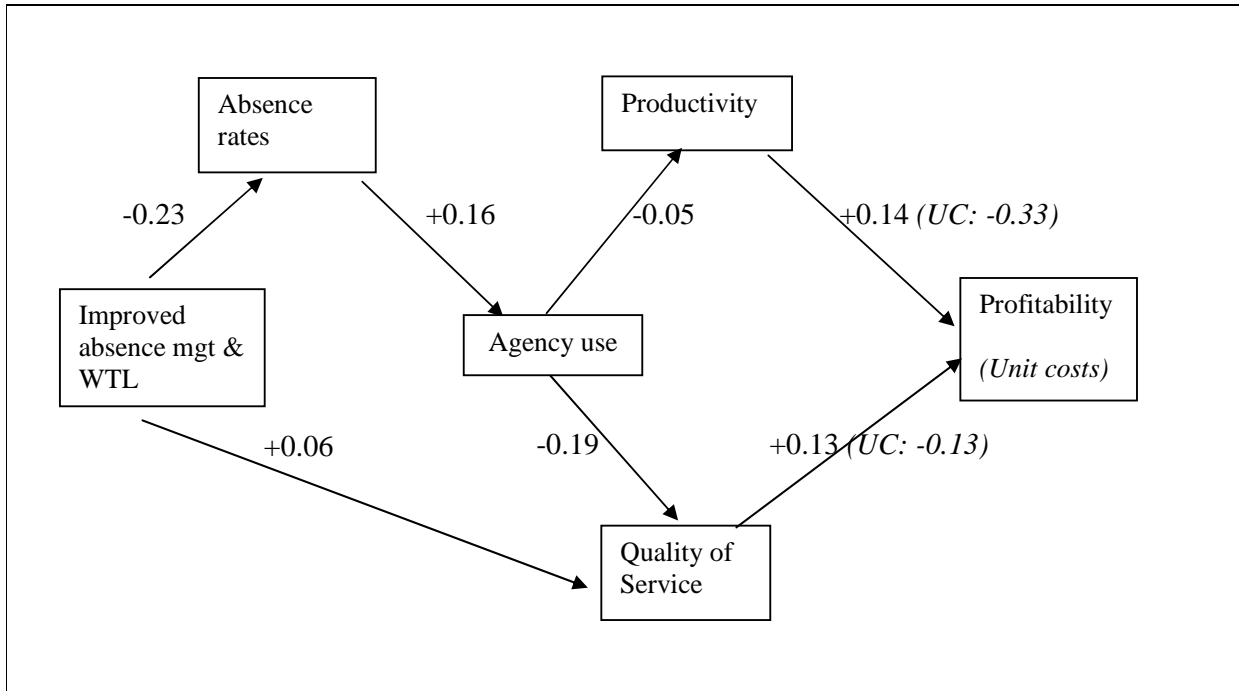| Variable description	Units	Obs	Mean	Std. Dev.	Min	Max
ITEMS	Items delivered per fte per day	954	40.27	7.13	18.97	70.38
UC	Operational costs per item delivered	962	3.13	0.55	-3.49	5.96
QS	% of items delivered on time	951	94.72	5.38	63.10	99.28
PROF	Net income per head per day	957	-19.14	103.45	-435.37	325.33
SICK	%	996	4.75	2.94	0.00	24.09
AGENCY	Headcount	955	23.15	22.04	0.00	154.70
Local unemployment	%	972	5.49	2.01	2.50	10.30
Local median hourly pay	£	972	9.53	1.29	7.71	13.69
Index of non-store sales	Base 100	996	100.12	11.75	84.10	131.80
Good manager	Factor score	996	-0.05	1.02	-3.26	1.92
Good company	Factor score	996	0.34	0.83	-1.88	2.09
Good job	Factor score	996	0.19	0.93	-5.47	1.83
Good WTL	Factor score	996	-0.25	0.95	-2.62	1.82
Good social facilities	Factor score	996	-0.05	0.93	-2.24	3.51
Female (%)		967	9.94	4.09	2.22	24.56
Part-time (%)	%	991	8.51	4.26	0.00	19.68
Permanent (%)	%	967	92.34	5.62	71.65	100.00
% Aged 35-39	%	967	17.10	6.10	0.00	35.71
% Aged 40-44	%	967	18.56	6.40	3.92	42.86
% Aged 45-49	%	967	13.45	5.29	2.38	25.00
% Aged 50-54	%	967	9.68	4.09	2.00	20.41
% Aged 55-59	%	967	8.08	4.23	1.35	17.65
% Aged 60-64	%	967	3.55	2.65	0.00	13.43
% Aged >=65	%	967	0.44	1.02	0.00	4.76
Length of service 0-4 years (%)	%	967	26.68	12.69	3.80	56.78

Notes: factor scores based on three years' data, 2004-2007.

Table A2: sickness absence and workplace performance: correlation matrix

	ITEMS	QS	SICK	PROF	UC
ITEMS	1				
QS	0.07	1			
SICK	-0.08	-0.17	1		
PROF	0.45	0.49	-0.08	1	
UC	-0.64	-0.07	0.05	-0.34	1

All correlations are significant at the 1% level

Table A3: WTL evaluation and sickness absence: SURE estimates

|	**Good WTL**		**SICK**	
Good WTL			-0.94	****
			[0,169]	
Non-store sales			0.038	*
			[0,024]	
Median local pay			0.402	
			[0,464]	
% female	-0.21	****	-0.117	
	[0,019]		[0,009]	
% permanent	3.753	**		
	[0,962]			
% age 35-44	0.05	****		
	[0,01]			
Urate	0.166	****		
	[0,035]			
Depot dummies	Y		Y	
Year, month dummies	Y		Y	
Observations	967		967	
R2 (adj)	0.808		0.432	

*Robust standard errors in brackets: **** <1%, *** <2%, **<5%, * <10%;*

Table A4. Path analysis coefficients, standard errors and diagnostics

|	Coef.	Std. Err.	Beta	Signif-icance
Sick absence rate (%)				
'WTL' good	-624	0.16	-229	****
Local unemployment %	-755	0.188	-577	****
R2	0.318			
Agency use				
Sick absence rate (%)	1.351	0.219	0.161	****
UK non-store sales	1.381	0.16	0.736	****
R2	0.579			
Quality of service				
'WTL' good	0.339	0.124	0.06	****
Agency use	-46	0.004	-186	****
R2	0.901			
Productivity				
Agency use	-15	0.006	-47	***
UK non-store sales	0.647	0.031	1.063	****
R2	0.86			
Profitability				
Quality of service	2.437	0.766	0.127	****
Productivity	2.09	0.5	0.143	****
UK non-store sales	0.922	0.561	0.104	*
R2	0.855			
n	930			
Unit labour costs				
Quality of service	-12	0.004	-128	****
Productivity	-23	0.003	-330	****
UK non-store sales	0.009	0.003	0.21	****
R2	0.811			
n	930			

Depot, year and month dummies used throughout; robust standard errors
**** <1%, *** <2%, ** <5%, * <10%

Chart A1. Monthly average rates of sick absence and of agency use (measured on different scales) in 2005/06 and 2006/07.
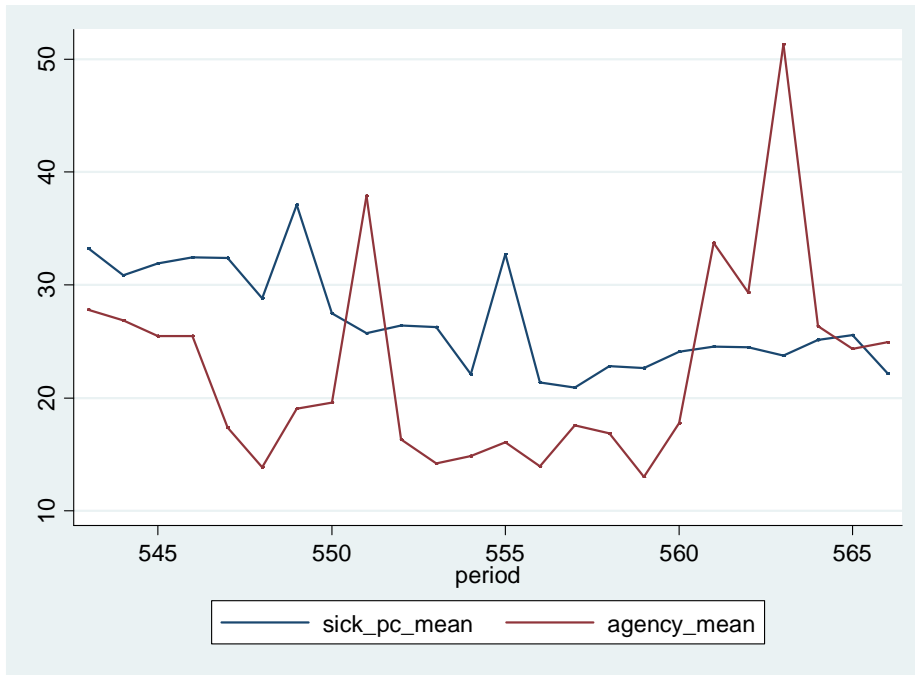
Notes: Sick absence (%, upper line) mean multiplied by 5 to compare with agency usage (no of ftes, lower line).

Chart A2. Means and percentiles of depot key performance indicators over time.
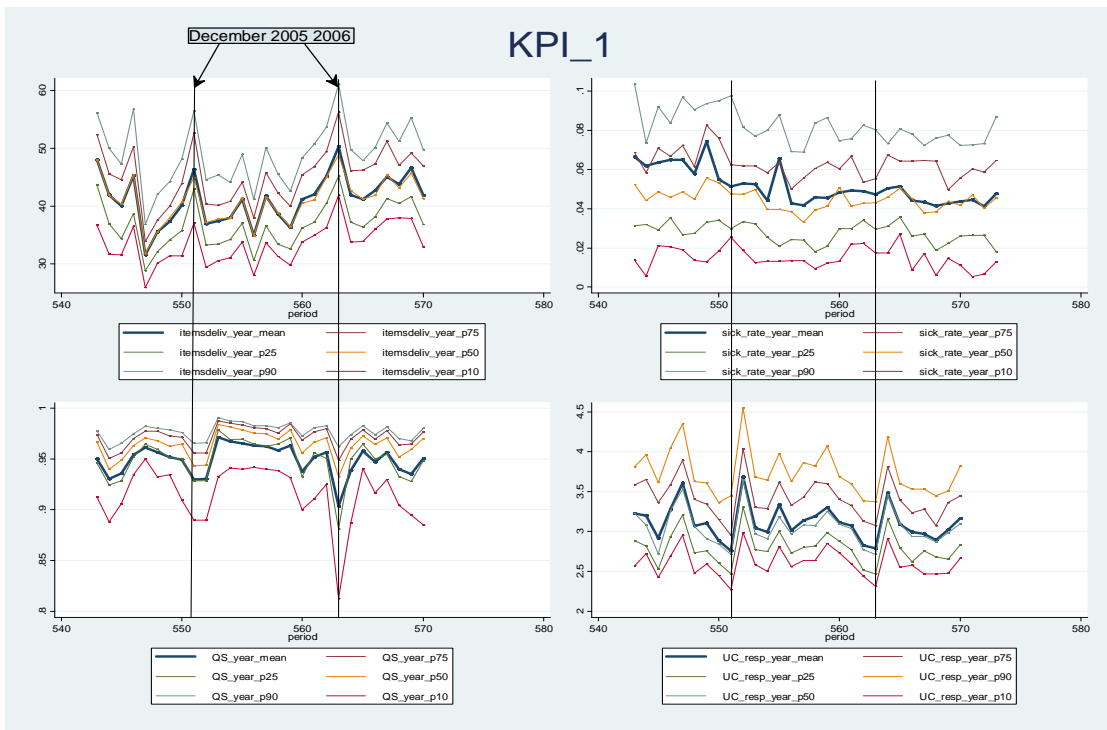
Appendix Graph 2 shows the dispersion of the depot key performance indicators over time. Reading the panels left to right, the upper panels show productivity (items delivered per full-time equivalent) and sickness absence (%), and the lower panels show quality of service and unit costs. The percentiles shown are p10, p25, p50, p75, and p90, and the mean.

It is notable that quality of service varies seasonally with the number of items delivered per full-time employee. Note also that the peaks in agency use follow the same seasonal pattern as parcels delivered and quality of service. This supports the view that the primary function of agency use is as a buffer to cope with varying customer demand, and that adaptation to absence uses the same buffer mechanism.

9. Appendix 1: Use of HYS attitude data to assess implementation of policies at depot level

Although the well-being and absence policies shown in Chart 2 were company-wide in their application, our interviews with both central and local management made it clear that there was also a good deal of variation at depot level in terms of how quickly and how effectively they were implemented. Our strategy has been to use this variation in order to gauge the effects of local management implementation. Of the questions asked in the employee surveys, those on the operation of WTL best capture the quality of depot level implementation of the well-being and attendance policies. The questions asked for more factual information than many of the other survey questions relevant to this study, and provide a 'view from below' about the conduct of aspects of depot management.

The depot level information on WTL from these surveys, relates to employees' participation in, and satisfaction with, the weekly team-level consultation and communication meetings, and whether management followed up and implemented issues that were raised there. In these meetings, typically, managers would have 10 minutes to raise their issues, and the team members, 10 minutes for theirs, with a further 10 minutes for joint matters. Participation by employees involves a cost on their part because they still have to get their jobs done, and in our interviews, depot managers told us that most common reason for not attending was that that their drivers just wanted to get out onto the road. Hence, their willingness to participate reflects their perception of WTL effectiveness, and their interest in discussing work-related issues with management.

How far can we judge that effective WTL is a good proxy for effective implementation of the absence and well-being policies? From our interviews with local managers, good WTL and good attendance management go hand in hand, and have a shared objective of improving workplace performance, and building on employee support. Both involve local management in committing some resources, in the first instance at team level, and in the second, at individual level. Both involve management seeking to improve employees' understanding of the company's needs, and understanding how their individual performance and attendance contributes to the overall picture. Indeed, there are good methodological reasons for its use. First, WTL covers most employees, including those who might potentially take absence but choose not to, whereas return-to-work interviews affect only those who have been absent. Second, the numbers going through the interviews in some months, especially in smaller depots, could be too small for a reliable statistical analysis.

Thus our key assumption is that depots with good communication for WTL will also have good communication for the return-to-work interviews, and those that are good at finding resources to meet employee issues in WTL will also be good at developing solutions to improve attendance. It might be objected that we are not measuring the incidence of absence and well-being policies so much as variations in the quality of local management. This cannot be excluded. However, improving attendance was one of the top priorities given to local management on the ground that it held the key to solving a number of the organisation's performance problems.

In Table A3, we show the results of our SURE regressions of measures of local management on sickness absence. They comprise two elements: the first equation concerns the determinants of 'good WTL', and the second, the influence of 'good WTL' on sickness absence. The variables included in the different steps merit some explanation. Concerning the determinants of good WTL, regular participation depends partly on management quality, and partly on employee interest. Willman et al (2006) argue that employees with a greater stake in their jobs will be more likely to want to voice their concerns to management, and see the business prosper. That stake is proxied by

taking the percentage of employees in the depot aged 35-44, the percentage who are permanent employees, and the local rate of unemployment. At age 35-44, drivers would be experienced and have developed a good knowledge of their routes and customers, something fostered by greater stability in the workforce, and high local unemployment would signal a paucity of competing jobs where they could use their skills. This 'asset specificity', according to Willman et al (2006), would lead to a greater demand for involvement of the kind occurring within the weekly WTL sessions. Concerning the influences on sickness absence alongside WTL, non-store sales capture the pressure of work, local median pay, outside job opportunities, and the percentage of women, the degree of household pressures on work attendance. We also confirmed the robustness of these years' data by extending the analysis to 2004/05. As can be seen in Table A3, good WTL is associated with lower rates of absence, and the effects are quite strong. Factor scores are measures in standard deviation units, with about 2/3 of all cases lying within one standard deviation unit of the mean, which in this case is zero. Thus, one could read the coefficients as follows: if a depot moves from the average score on WTL effectiveness to the score within the top 15% of depots, its absence rate would fall by nearly one point (-0.944).

10. Appendix 2: Path analysis of the impact of absence policies on net income and unit costs

Table A4 reports the detailed results of a "path analysis" shown in which suggests what the relative strengths of the different linkages may be in terms of standardised units based on their respective standard deviations. All coefficients are statistically significant: in particular, the coefficient of 1.3 for the impact of sickness on agency use in Table 5 becomes 0.16 in terms of the two variables' relative standard deviations. The path analysis suggests that the impact of agency use may be more damaging to quality of service than to productivity (unit costs).[13] The impact of improved productivity is to raise profitability (+0.14), but by about half the amount that it reduces unit costs (-0.33). The impact through quality of service on profitability is almost equivalent to the one on unit costs (+0.13 vs -0.13) i.e. improved quality of service seems to be as effective at increasing firms profitability as at increasing its efficiency.

Finally, notice that the main purpose of the path analysis has been to provide an illustration of the statistical relationships behind the organisational model which emerged from the interviews with the line managers. Of course this does not preclude the influence of other mechanisms than that described and which could cause absenteeism to lowers firms' profitability and efficiency.

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[13] This may reflect difficulties in redistributing work when agency staff are used because of their lesser familiarity with the job, and the growing importance of timed deliveries. Thus although it may be possible to maintain the *volume* of collections and deliveries, and thus physical productivity, when agency staff are used, it is much harder to meet the customer deadlines which lie at the heart of service quality.

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