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## Discussion paper

# Pay and performance in a call centre; principals and agents or principally angels?

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This series consists of papers with limited circulation, intended to stimulate discussion.

# Pay and performance in a call centre; principals and agents or principally angels?\*

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## Abstract

We use data from a pay reform in an insurance company to contrast different theories of work motivations. The management installed performance pay to boost sales in the customer service centre of the company. The reform was successful. The bonus scheme gave the operators both self-regarding and other-regarding incentives to increase sales. The increase in sales does therefore not in itself help us identify the underlying motivation of the workers. However, when we examine the evolution of the design and impact of the scheme, we conclude that the standard principal-agent model best explains the patterns in our data.

**Keywords:** Team incentives, multi-task, fairness, reciprocity.

**JEL:** C23, C72, J33, M52

## 1 Introduction

This paper examines data from an insurance company that included a performance bonus in its customer service unit, an inbound call centre. In addition

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to providing information to customers, the operators also sell insurance products. In fact, the bonus scheme we analyze was initiated to stimulate sales in customer service.

Prior to the introduction of performance pay (2001) the customer service unit was divided into teams, each consisting of 10 to 12 members. The pay reform added a quarterly bonus to the salary of the operators. Individual bonuses depended on team performance along three dimensions, sales, efficiency (increasing in the number of calls answered) and customer satisfaction. To qualify for a bonus a team had to beat a pre-set sales target. If qualified, the magnitude of the bonus increased in sales and in *relative* efficiency and customer friendliness.

Comparing sales before and after the reform we find that introducing performance pay was a success. Sales increased, both because the operators answered more calls and because they sold insurance to a larger fraction of the customers they served. The reform's effect on sales endures when we control for sales in other divisions within the company not affected by the reform, and for a number of other factors that could have an impact on sales. Our findings here are in line with several recent case studies of incentive pay.<sup>1</sup>

We have a second more ambitious aim with this paper. We want to use our data to delineate the causal mechanisms behind the design and impact of the pay reform. The principal-agent model is our benchmark. This model builds on two premises, rationality and egoism and can be stretched in two directions. We can expand the motivation of the management and employees, or restrain their cognitive capacities. Recent experiments in behavioral economics indicate that we need to take account of other-regarding and process regarding preferences in order to understand the design and impact of compensation contracts at work places, Fehr and Schmidt (2006) and (2007). In organization theory it has long been argued that decision making processes within firms are less coherent than the economic agency model envisages, March (1994). The question we address is: How far do we have to stretch the principal-agent framework in order to make sense of the patterns we observe in the design and impact of the pay reform?

Our finding that productivity increases when a firm introduces monetary incentives, is often taken as evidence that supports standard economic incen-

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<sup>1</sup>See Prendergast (1999) for an overview of the empirical literature on performance pay, and Chiappori and Salanie (2000) for a presentation of empirical studies of economic contract theory more generally.

tive theory. That conclusion is premature for two reasons. A full appraisal of this framework also requires a careful examination of the design of the pay reform. It is not enough to examine how workers adjust their behavior to monetary incentives, we also have to consider how well the choice of contracts square with the theory. A second concern is that although the principal-agent model readily explains why employees work harder when the management adds a performance bonus to an existing salary, this response is also consistent with models that emphasize the importance of social preferences. Reciprocity motivated workers who care about fairness and generosity work harder if they find the performance bonus generous and the process behind the reform fair. In that case productivity increases not only, or primarily, because the reform explicitly links pay to performance, but also because the bonus is taken as a kind and fair act that workers want to reciprocate. Our data strongly suggest that the operators appraised the bonus scheme to be both fair and generous. Hence, the observation that the reform enhanced productivity cannot in itself be used to discern the motivational hypothesis we compare. To identify the causal mechanism behind the workers response we need to examine the pay reform, and how workers adjusted to it, in greater detail.

One type of information we use to identify the motivation behind the employees' response to the reform, is the severity of the multi-task problem created by the reform: To what extent do workers exploit incompleteness in the scheme to increase their own income (reduce their own costs) at the expense of the company's profit. Our data indicate that the employees took advantage of the scheme in ways that are hard to reconcile with the idea that it was reciprocity and fairness concerns that caused them to increase sales effort in the first place. On the other hand, the multi-task problems we observe are easily explained within the standard principal-agent model.

As another identification strategy, we exploit the fact that the management made an unfriendly or hostile modification of the scheme in 2004. The initial contract was shaped in negotiations with representatives of the workers and it had been renegotiated on a yearly basis until 2004. At that time the management did not want to renew the existing bonus contract. They refused to negotiate the contract with the workers and decided to implement a bonus contract by dictate. If reciprocity and fairness concerns were significant motivations for the employees we should expect a subsequent drop in sales productivity. There are no signs of such a response in our data.

Our research is an example of what Ichniowski and Shaw (2003 call "in-

sider econometrics", and it contributes and extends the literature that exploits firm-level variation in compensation contracts to measure the effect economic incentives have on worker behavior, important examples are Paarsch and Shaerer (1999), Lazear (2000) and Haley (2003). A novel aspect of our research is the attention we pay to the design of the reform. Most empirical studies of performance pay focus on how workers respond to monetary incentives. The outline of the reform, and the process behind its design, is often ignored, either because the plan is so simple that it warrants no discussion, or because the researchers lack sufficient information about the scheme they investigate. Hence, as researchers we know far too little about the forces that are at play at the management level when compensations contracts are shaped in a complex work environment.<sup>2</sup>

Our research also supplements the experimental literature on reciprocity and incentives. Several laboratory experiments indicate that "workers" have social preferences, and that other-regarding and process-regarding concerns have important implications for the design and impact of economic incentives.<sup>3</sup> Although it is crucial to find out to what extent these results extend the laboratory, there are few studies that use field observations to gauge the importance of altruism, fairness and reciprocity in work relations. In this respect our paper fills a void in the literature.

The paper is organized in the following way. In the next section we briefly present the customer service centre. Section three presents the wage reform, both its initial outline and subsequent changes. Section four provides a theoretical backdrop for our discussion. In section five and six we assess, respectively, the design and impact of the scheme in light of the theoretical perspectives we contrast.<sup>4</sup>

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<sup>2</sup>There are, however, studies that use industry level data to assess how well standard economic incentive theory predicts the choice of compensation contracts, see Parent and MacLeod (1999) and Brown (1990).

<sup>3</sup>See Fehr and Falk (2002) for an overview of the literature that studies how monetary incentives affect other regarding behaviour. Fehr and Schmidt (2004) and Fehr, Klein and Schmidt (2007) present experimental data on how fairness and reciprocity affect the design of incentive contracts.

<sup>4</sup>Bandiera, Barankay and Rasul (2005) use a field experiment with performance pay to study work motivation. They find that productivity is higher with a piece rate bonus than with a bonus that depends on relative performance evaluation within the work group. They take this as evidence that there are social preferences among the workers.

## 2 The work environment

We study an important occupation. More and more firms apply phone based customer service to assist their customers. The nature of the services provided in call centres varies between work places. Some operators respond to simple requests, they inform customers about their bank balances, or register the purchase of a ticket, etc. Others must give detailed responses to intricate questions. Our case belong to the latter category.

The phone system in the customer service centre automatically channels new calls to available operators.<sup>5</sup> The operators use the computer system to retrieve information needed to assist customers, and to register new information in the customer data base. The operators' main assignment is to provide accurate information in a friendly and courteous way. Their job is to inform existing clients about their insurance coverage, update them on any policy changes that seem relevant and inform them about new products that are available. To provide high-quality services the operators must pay careful attention to the customers' requests and have extensive knowledge about the company's insurance products. In addition, they must handle requests for information as fast as possible in order to minimize the time other customers have to wait for assistance. Ideally, most of the work, the provision of information, changes in existing insurance contracts, registration of new contracts etc., should be done on-line during the phone call.

The operators also sell insurance products. To do a good job, operators must balance the time and effort spent on selling new products against the time and effort spent on customer service. Furthermore, selling insurance products is not a one-dimensional task. It is well known that insurance providers must take account of adverse selection and moral hazard problems. Hence, it is important to collect information about the "type" of the customers and use this information to design an appropriate insurance contract. It is not in the company's interest to maximize the number of sold insurance products.

The customer service centre was restructured in July 2000. A new customer service division was then established in the private lines of the insurance company. A central part of the reorganization was to divide the

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<sup>5</sup>The customer service consultants make a few outbound calls to gather information etc. They also call back customers that choose to leave their number instead of waiting for an answer when the lines are congested.

operators into different teams, each consisting of 9 – 10 call-centre employees and a team leader. The teams are clustered together in a big open office landscape. When performance pay was introduced at the commence of 2001 there were around 200 individuals working in the service unit of the insurance company, around 130 – 140 of these were employed at the call centre.

The team leaders organize the team work and motivate and supervise the operators. In particularly strained periods – when the service level at the centre is low, i.e. when the queue of waiting costumers is long – team leaders will pick up the phone and answer inbound calls. Due to the fact that the team leader has distinctively different tasks than the team members, he/she is not included in the bonus system we examine.

The operators are instructed to log on the phone system when they arrive at work and not log off the system unless meetings – or other arrangements - take them away from the phone system for more than an hour. Shorter breaks should, according to the instruction, be included in time logged on. On average the operators are logged on the system somewhat less than five hours a day. The workload for a full time position is 7 hours and 30 minutes a day. The gap between a full day and actual time logged on the system is due to sickness absence, various meetings, courses and seminars. On average an operator answers around 40 calls per day. This includes call-back calls. In addition the operators make on average 7 or 8 outbound calls a day, normally to gather essential information about customers' insurance policies.

Most of the operators are relatively young, the average age is around 30 and the typical employee has 2 or 3 years of college education and has worked for the insurance company for 4 years. There is a slight surplus of women working in the customer service centre. Turnover is relatively high, although it has dropped considerably since the reorganization of the customer service unit. Those who leave the call centre either move to other divisions in the insurance company, or leave for jobs outside the company.

### **3 The pay reform**

The management began to discuss the introduction of a pay reform to increase sales in customer service in the spring of 2000. Small scale, sporadic, sales campaigns offering small prizes to outstanding performance, had been used earlier. But this reform was of a different kind. The plan was to implement performance pay on a more permanent basis and at a much larger

scale than the sales campaigns that had been used earlier.

The design of the pay reform was shaped in negotiations with worker representatives. The parties disagreed on several issues. The management preferred a tournament based bonus scheme, while those representing the workers favoured a system where the workers competed against preset standards. The management preferred a scheme that mainly rewarded individual performance, while the representatives of the employees preferred team based incentives. The most critical issue in the negotiations was how one should handle sick absence. Due to these disagreements the negotiations dragged and the contract was not signed before the last week of February 2001. However, the management and the union had agreed that *if* the negotiations turned out successfully and a contract was signed it should be given retroactive effect and be in force as of January the 1st. In the initial contract the parties also agreed to renegotiate the contract on a yearly basis.<sup>6</sup>

Since its introduction, the bonus scheme has been changed several times. In this section we describe the outline of initial contract and its amendment over time.

### 3.1 The initial contract

The initial contract was intricate. The bonus was based on team performance and depended on three different performance variables: sales, efficiency and customer satisfaction.

Each team had to meet a prefixed sales target in order to qualify for a bonus. The sales target was fixed at 102% of a team specific sales budget. The sales budget was determined in a top-down process within the firm. First the central management of the company specified an overall sales budget for the whole company. The aggregate budget was then divided on different sales channels within the company. The customer service unit is one sales unit and the management there divided their sales budget among different teams according to their manpower. Passing the sales target of 102% of a team's sales budget yielded 1250 kroner in quarterly sales bonus per team member (average monthly pre tax wage was at that time approximately 22000

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<sup>6</sup>The information we have on the outline of the pay reform is gathered from various sources. We have had access to all written agreements between the parties. In addition one of the authors participated in several managerial meetings where the implementation of the pay reform was discussed. We have also interviewed the management and some of the team leaders at the customer service centre.

kroner). The sales bonus increased thereafter in a stepwise manner - with 8 steps - until a maximum reached at 130% of the sales budget, which yielded each team member 2500 kroner in sales bonus.

Each team that sold more than 102 % of their budget could multiply its sales bonus with a factor that depended on how efficient and customer friendly it was relative to the other teams.<sup>7</sup> Efficiency was measured at the team level as the number of incoming calls answered divided on the number of hours team members were logged on the phone system. To assess customer approval the company contacted a random selection of the customers and asked them to grade the support they got from the service centre on a scale from 1 to 7, with 7 as the highest score. The teams were then ranked along these two dimensions, and those that belonged to the one third with the lowest rank sum were considered as winners of the efficiency/customer approval tournament. The winners could multiply their sales bonus with a factor of four. The next one third could multiply their sales bonuses with a factor of three, while the one third with the highest rank score only received their sales bonus. Teams that did well in the tournament but did not pass the sales hurdle did not receive any bonus payments. A team that sold 130% of the budget (or more) and was ranked in the best one third of the teams in the tournament would get a bonus of approximately 15% of their regular salary.

A critical question with respect to the sales bonus was to what extent teams should be compensated for sick absence. The employees found it unfair that sick absence among some operators should reduce other team members' possibility to achieve a bonus. In the negotiations they required full sales compensation. Their proposition was that an absent team member should be ascribed the average sales in the team in the period that he or she was away from work. The management was reluctant to accept this requirement. The parties finally agreed on a compromise where teams were compensated only for long term sick leave (if they were absent more than 14 days).

## **3.2 Changes in the contract**

In the initial agreement the parties concurred to renegotiate the contract on a yearly basis. All changes made in the negotiations should be implemented

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<sup>7</sup>Note that a team would not receive a bonus unless it passed the sales target, no matter how well it performed on other tasks.

in the second quarter of that year. The performance pay scheme has been altered several times in the period from 2001 until 2005.

At the first renegotiation, in 2002, the management agreed to extend the sickness absence compensation to include short term absence, but only if those absent could display a medical certificate confirming their illness.

In 2003 the parties agreed to add two new performance indicators to the initial contract. One new variable was *premium discount*, measured as the difference between the tariff premium and actual premium of the insurance products that were sold. Another variable that was included in the scheme was the team's claims ratio on its sold portfolio of insurance. Premium discount and claims ratio were lumped together to measure the *profitability* of sales; teams that gave a low premium discount and had a low claims ratio scored high on profitability. In the rank order tournament "profitability" accounted for 50% of the rank score; a team that was ranked as number 3 in efficiency, 4 in profitability and 7 in customer service would get a total rank sum of  $3 \cdot 0,25 + 4 \cdot 0,5 + 7 \cdot 0,25 = 4,5$ ).

In 2004 there was a radical change in the bonus program. The management refused to renew the existing incentive contract. Negotiations broke down because the management were no longer willing to compensate teams for sick absence. The management suspected that this arrangement was misused by some of the teams. Their impression was that in some teams, low productivity members tended to turn "sick" in periods when it was important to increase sales in the team (recall that absent workers would be assigned the *average* sales productivity in the period they were away from work).

But although the management refused to sign the bonus contract in 2004, they had not lost faith in the benefits of using monetary incentives to motivate their employees. Hence, they decided to carry on with performance pay, but now as quarterly campaigns. By relabeling the bonus scheme as quarterly campaigns the management did not have to negotiate the design and terms of the bonus scheme with the union. Hence from the second quarter of 2004 the design of the scheme was no longer shaped in negotiations with representatives of the workers. The bonus scheme was now dictated by the management .

The first campaign, introduced in the second quarter of 2004, was in many respects a copy of the negotiated contract that was not renewed, but some significant changes were made. Sick absence was no longer compensated. The management also individualized the bonus scheme. The magnitude of the sales bonus was unaltered, but only half of an operator's sales bonus was

based on team sales, the other half was based on individual sales. In addition management eliminated efficiency and “profitability” from the scheme and added two new performance measures. One was a “quality of work measure” that was based on the number of omissions and mistakes in the contracts that was sent to the customers. The other was related to changes in the renewal rate of existing insurance contracts. The tournament between teams was also abolished; the bonus associated with the “quality of work” and renewal of policies depended on absolute, not relative performance.

The sales bonus was individualized further in the third quarter of 2004. Now 75% of an operator’s sales bonus was based on individual sales, and 25% on team sales. Efficiency was reintroduced as a performance measure, but in a much weaker form than before. Team level efficiency mattered only in periods when the service level at the centre was low. The service level is a measure of how long the average customer has to wait before she can talk to a customer service consultant. A service level of 80 implies that it takes 20 seconds to get in touch with a customer service consultant. A lower service level implies that the customers have to wait longer. In this quarter all operators received a small bonus in weeks where the average service level at the centre was above 60%. If the service level fell below this target only agents in teams with a weekly average efficiency above 5,2 (teams that answered more than 5,2 calls per hour logged on) would earn the bonus. The quality measure (mistakes made in the contract) was abolished. The renewal measure was kept as before, and a new variable that depended on the overall service level in the call centre was introduced. In the last quarter of 2004 there were no significant changes in the performance pay campaign. The evolution of the bonus scheme is summarized in Figure 1.

[Figure 1 here]

## 4 Theoretical background

The pay reform was installed to increase sales of insurance products in the customer service centre. Weekly sales at the centre can be written as

$$s = p\gamma x, \tag{1}$$

where  $x$  is the number of incoming calls per week,  $\gamma$  is the fraction of the incoming calls answered, and  $p$  is the fraction of attended customers that

buys an insurance product. The number of incoming calls is outside the control of the operators, but their effort and talent affect sales via  $p$  and  $\gamma$ . The longer operators are logged on the phone system and the faster they serve each customer, the higher is the fraction of incoming calls that are answered. The fraction of customers that purchase new insurance products depends critically on the relative attractiveness of the company's product, but the talent and effort of the operators also matter. Some individuals are naturally gifted sellers, others must strive harder to convince a customer that this insurance product is just what she needs.

Increasing sales effort generates costs and benefits for the operators. To answer more calls the operators must make fewer calls to friends and family, take fewer breaks and chat less with their co-worker. In short, they have to cut down on activities that give variation in a hectic workday. To sell insurance to a higher fraction of attended customers, the operators must make an effort to learn more about available insurance products, pay more attention to the customers to identify their needs and be a more assertive seller of the company's products.

On the other hand exerting effort can be intrinsically rewarding and can produce a variety of extrinsic benefits. What an employee recons as the beneficial effects of increasing effort depends on her motivation (preferences). But whatever it is that propel her work, at some level the marginal costs of increasing effort starts to outweigh the marginal benefits. At which level the marginal costs starts to outweigh the benefits depends on the incentives the employees face. The pay reform was initiated because the management thought that the operators had insufficient incentives to sell insurance products. A major concern for the management was the hazard that powerful sales incentives could lower the quality of the services provided in the centre.

In this section we develop a simple formal model of the situation at the call centre. The model is meant to be illustrative; we do not attempt to estimate parameters of the model in our empirical section, but we believe this formal set-up gives credence to our empirical set-up and to the patterns we later use to set apart different behavioral hypothesis.

Consider a customer service consultant allocating effort on two tasks, sales and service. Let  $a$  be the effort the agent exerts on sales and  $e$  the effort he exerts to provide high quality services. The preferences of the operator can be represented by this utility function

$$u(a, e) = w + \lambda y - \frac{1}{2}(a - a^*)^2 - \frac{1}{2}(e - e^*)^2 - \frac{1}{2}(a + e)^2, \quad (2)$$

where  $w$  is the wage that the worker receives,  $y$  is the income the principal earns and  $\lambda$  signifies the value a worker assigns to the income earned by the principal.  $\lambda$  can be positive or negative. With this specification the direct utility effect of increasing sales- and service effort is positive over some range as long as  $a^* > 0$  and  $e^* > 0$ . Taking the partial derivative of utility we get  $u_a = -2a - e - a^*$  which is positive as long as  $a < \frac{1}{2}(a^* - e)$ . Suppose alternative employment gives an operator utility  $u^0$ . To capture the importance of a balanced work effort let  $y = ae$ .

There is no uncertainty in the model simply because this aspect of incentives and motivation is unimportant for the issues we are concerned with here. We also disregard the talents of the operators, although the quality of the workers certainly have an impact on productivity. It is well known that introducing monetary incentives can increase the average skills level in a firm, since high ability workers will benefit more than low ability workers from the introduction of performance pay, see Lazear (2000). Our data is on team performance and cannot discern individual talents from effort. We do not consider this to be a major problem for in our case. In the empirical section we show that the impact of the pay reform came immediately after it was introduced. There were now new recruitment to the teams we study at that time. Another point is that even in the longer run the self selection of high ability workers reported in Lazear (2000) is less relevant when team performance is rewarded. With team bonuses high skilled workers have to share their output with the whole team (in our case nine other workers).

## 4.1 The principal-agent model

The canonical economic model of labour relations builds on the joint assumptions of rationality and egoism. Workers calculate their own material payoff of exerting effort on different tasks, and allocate their energy where their personal gains are maximized. They do not consider how their own behavior affect the principal's outcome, which means that  $\lambda = 0$  in (2). The principal-agent model does not rule out intrinsic motivation ( $a^*$  and  $e^*$  can be positive numbers), but it assumes that intrinsic motivation cannot be affected by the principal. The agent takes compensation ( $w$ ) as given and chooses  $a$  and  $e$  to maximize  $u(a, e)$ .

The owners of the firm, often represented by their managers, are equally selfish and clever. They infer how self seeking workers react to organizational changes, for example to changes in the magnitude and structure of their

compensation, and given the workers' response they implement arrangements that best serve their own interests. More formally, the management takes account of the incentive constraint and the outside option of their employees and chooses a policy that maximizes profits  $\pi = y - w$ .

Prior to the reform the workers faced a fixed salary  $w^0$ . Maximizing  $u$  with respect to  $a$  and  $e$  with  $w = w^0$  yields effort  $a^0 = \frac{2}{3}a^* - \frac{1}{3}e^*$  and  $e^0 = \frac{2}{3}e^* - \frac{1}{3}a^*$ . In the spring of 2000 the management saw, for reasons we do not model, a potential for higher sales in the customer service unit. What we are interested in here is what kind of pay reform the principal-agent model prescribes in this case.

Note first that within this framework the only reform that can induce higher sales is one that rewards higher sales with higher income. More formally, to increase  $a$  the management must install a pay reform such that  $\frac{\partial w}{\partial a} > 0$ . Hence, the principal-agent model foresees a reform in which a sales bonus plays a key role. The exact outline of the bonus depends on the information that is available and enforceable, and on the institutional setting the company operates in. If performance is verifiable, the management might offer a legally enforceable performance contract to motivate their employees. If, however, it is difficult to find comprehensive, verifiable performance measures the firm must employ self-enforcing incentive contracts where monetary rewards are conditioned on non-verifiable performance measures (objective or subjective) and compliance is secured by internal punishment of deviant behavior.<sup>8</sup>

In our case there are objective, verifiable and accurate sales measures available. Hence, the principal-agent model predicts that the management will employ a formal incentive contract with a sales bonus to encourage higher sales. In addition the model makes a number of predictions with respect to the outline of the contract.

1. In the principal-agent framework it is the magnitude and structure of the performance bonuses (relative prices) that determine the impact of

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<sup>8</sup>Firms can employ two kinds of self-enforcing incentive contracts. One alternative is to increase the salary and announce conditional renewal of the relationship, see Shapiro and Stiglitz (1984). Alternatively, the firm may keep the salary at its old level, but announce that a bonus is paid if performance is sufficiently improved. Consult MacLeod and Malcomson (1998) for a comparison of these alternatives, and MacLeod (2007) for a comprehensive discussion of enforcement problems and incomplete contracts in long lasting principal-agent relations.

a pay reform. The process followed in the outline and implementation of the reform, and the way incentives are framed and communicated, have no separate bearing on the workers' response. Hence, if negotiations increase the administrative costs of implementing a bonus scheme we should not expect the management to *voluntarily* involve the employees in the outline of the scheme, unless the management obtains useful information from negotiating with its employees.

2. The generosity of the bonus scheme, measured as the rent workers receive (utility above outside option), does not in itself affect effort when agents are offered a *legally enforceable* incentive contract. Hence, if the firm includes a sales bonus that increases the utility of the workers, the model predicts that it will, if possible, reduce the fixed wage element in the compensation scheme.
3. The multi-task problem is a notorious quandary in the principal-agent model. It arises because selfish agents tend to neglect responsibilities that are not explicitly rewarded in the contract. The customer service consultants we study work in a relatively complex work environment. Suppose for simplicity that the principal can observe and verify sales effort, but not service effort, and offers a compensation scheme  $w = w^b + ba$ . Maximizing  $u$  with respect to  $a$  and  $e$  when  $w = w^b + ba$  yields efforts  $a = \frac{2}{3} [a^* + b] - \frac{1}{3}e^*$  and  $e = \frac{2}{3}e^* - \frac{1}{3} [a^* + b]$ . The latter formula envisages the multi-task problem. Increasing the sales incentives  $b$  induces higher sales effort but at the expense of lowering service effort. The principal-agent model predicts that the management of the call centre will try to balance the sales bonus with a reward on service provision.
4. Team incentives tend to be unproductive in the standard economic incentive model, since selfish individuals are inclined to free ride on others' work effort. The principal-agent model therefore predicts incentive contracts based on individual performance measures, unless individual performance data are not too costly to obtain (compared with more aggregate performance measures). If team incentives are used, the model predicts that the management will organize the work environment such that individual workers can be monitored by peers or by supervisors.
5. A final issue that is discussed in the principal-agent model is the ratchet

problem. The problem arises when the implementation of monetary incentives induces the employees to strategically lower their current effort in order not to be measured against tougher standards in the future. To avoid strategic under-performance, the management must commit not to let future standards depend on current behavior. The principal-agent model predicts that the management recognize this problem and arrange matters so as to avoid it.

## 4.2 Extended motivation

The principal-agent model has been criticized by sociologists, psychologists and other analysts outside the economics profession. Economists are well aware that individual behavior is not fully described by this simple model but consider it to be a useful approximation that improves our understanding of social interaction inside firms and other organizations. However, over the last two decades a large body of evidence has been collected by experimental economists, indicating that many individuals have motivations that extend their own narrow self interests, and that these motivations have important implications for the design and impact of monetary incentives in work relations. Reciprocity and fairness are examples of other regarding motivations that have gained a lot of attention in the recent literature.<sup>9</sup>

When we extend the motivation of employees it is no longer the case that the management *must* install a sales bonus to induce higher sales effort in the call centre. Reciprocity motivated workers have social preferences which dispose them to respond to like with like. If workers are offered favorable employment conditions, for example if they are compensated openhandedly relative to some reference situation, they are motivated to exert personally costly effort to enhance the productivity of the firm.<sup>10</sup> Formally, if the workers perceive the contract to be good willed and generous  $\lambda$  will increase, and an increase in  $\lambda$  induces the operators to exert higher effort on both tasks.

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<sup>9</sup>Rotemberg (2006) discusses the importance of reciprocity at workplaces, Fehr and Schmidt (2006) gives an overview of the experimental literature on reciprocity and fairness and Sobel (2005) gives a comprehensive discussion of reciprocity in social exchange.

<sup>10</sup>Reciprocity has a negative side. If workers are reciprocity motivated one may even observe that the introduction of performance pay lowers the workers' effort. This could happen if the workers perceived the bonus to be unfair and unkind. Experimental evidence indicates that explicit incentives can backfire motivation that relies on rule compliance, reciprocity and intrinsic motivation, see Fehr and Falk (2002) for an overview.

Hence, in a model with reciprocity motivated workers even a generous increase in the fixed salary could increase sales in the centre. But, of course, there is nothing in this framework that prevents the management from using a performance pay to motivate their workers. However, *if* workers are motivated by other-regarding concerns and process-regarding concerns this has profound implications for the design and impact of performance pay. The list below should be contrasted with the one in the principal-agent section.

1. If the employees care about the generosity and fairness of a reform, they will presumably be concerned with the procedures the firm follow when they design and implement a reform. Hence, one should not be surprised if the management included the workers in the reform process.
2. If reciprocity is an important motivation among the employees, then it may not be in the best interest for the principal to seize all the surplus generated by the reform. Leaving some rents with the employees will increase their  $\lambda$  and induce them to exert higher effort. Hence, the model with extended motivation does not predict that the inclusion of a bonus should be fully offset by a reduction in the fixed salary.
3. A generous but incomplete bonus scheme will be less exposed to the multi-task problem if workers are reciprocity motivated. Suppose for example that the management installs a generous sales bonus that is not balanced with a bonus on service provision. In the principal-agent model such a bonus will lead to severe multi-task problems. The problem is not so pressing if workers are reciprocity motivated. A generous sales bonus increases  $\lambda$  and a higher  $\lambda$  implies that the agents are inclined to exert more service effort to generate income for the principal.<sup>11</sup>
4. Another implication of extending the motivation beyond strict self interest is that the free rider problem traditionally associated with team incentives become less pressing. Reciprocity motivated workers are conditional cooperators; they prefer to exert high effort if their co-worker work hard. Hence with reciprocity motivation there are two equilibria in a team production game, one in which they all work hard and one in which effort is low.

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<sup>11</sup>See Fehr and Schmidt (2005) for an experiment where principals can choose different compensation schemes in a multitask environment.

5. Note also that reciprocity and fairness motivated principals are less concerned with designing explicit incentive contracts based on objective, court enforceable performance measures. Reciprocity is in itself a contract enforcement device; reciprocity motivated principals do not want to renege on a promised bonus if workers perform well. The ratchet problem is therefore not so acute when principals and agents have motivations that extend their own material self interests.<sup>12</sup>

## 5 Assessing the design of the pay reform

This section addresses two questions: How much do we have to bend and stretch the principal agent model in order to make sense of the outline of the pay reform. How much more of the design do we grasp if we extend the motivation of the management and the employees? To answer these questions we use information about the design of the pay reform and more subjective or intentional information gathered from interviews of the management.

### 5.1 The initial scheme

Given the aim of the management it is perfectly in line with the standard principal-agent model to observe a signed, explicit, enforceable incentive contract in which a sales bonus plays a prominent role. The fact that the overall bonus depended on two additional performance measures also squares well with this model: The primary reason for introducing a pay reform was to increase sales, but the management were worried that a pure sales bonus would tempt the operators to neglect other important tasks, like answering calls and provide high quality services to existing customers.

The use of a team based bonus is harder to reconcile with the principal-agent model. Individual performance is recorded in the centre and there are few complementarities between individual work tasks at the centre. Hence, there are no technological reasons for choosing a team based scheme. When we inquired about the reasons for choosing a team based bonus, the management told us they had indeed, considered the possibility of free riding,

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<sup>12</sup>See Fehr, Gächter and Kirchsteiger (1997) for an elaboration on reciprocity and commitment and Chaudhuri (1998) for discussion (and experiments) of reciprocity and the ratchet problem in a dynamic principal agent model.

i.e. that a team based scheme could dilute individual incentives for increasing sales effort. But they concluded that this was not a likely outcome for two reasons. The fact that each team worked in an open office landscape enabled both peers and team leaders to monitor and discipline individual workers. The management also believed that team work was more enjoyable, and that a team based tournament would create a kind of team spirit that could boost individual effort. They argued, without being explicit about it, along the lines of Akerlof (1982); team work may foster motivations that underpins norms of high effort (no cheating). Another reason for using a team bonus mentioned by the management, was that it would reduce the administrative costs associated with managing the scheme. Furthermore, a team bonus was preferred by the employees.

Another key feature of the bonus scheme was that the overall bonus depended on the outcome of a *tournament* among the teams. The traditional principal-agent argument in favour of relative performance evaluation is that it reduces the workers' income risks since it eliminates common noise in the performance measures. In the principal-agent model this advantage must be weighed against the possibility that the agents engage in sabotage. None of these arguments were mentioned by the management when we asked why efficiency and customer service was based on relative performance. The management of the call centre had been given a fixed amount of money to establish a pay reform, and one way to make sure that total bonus payment did not exceed their "bonus budget" was to use a tournament based incentive scheme. However, the operators did not accept a bonus system that was solely based on relative performance. They preferred competing against prefixed standards established in negotiations between the worker representatives and the management. Thus, the contract was a compromise between the system preferred by the management and the system preferred by the employees.

It is not easy to rationalize the non-linearity of the sales bonus (recall that sales above 130% of the budget did not trigger any extra bonus). One could argue that putting a cap on the sales bonus was done to limit the "too-much-focus-on-sales" problem. But the multi-task problem had already been handled by letting the bonus depend on two additional performance measures. When we asked about the cap on the sales bonus, the management alluded to a fairness argument; if a team sold more than 130% of its budget this clearly indicated that the target was set too low, and it would be unfair to reward the teams in this case. Another argument was budgetary concerns,

without any ceiling the total cost of the pay scheme was difficult to estimate.

One aspect of the reform that seems particularly difficult to account for within the principal-agent model is the generosity of the bonus scheme. The bonus increased the workers' average compensation with approximately 7%. Standard incentive theory instructs the management to reduce the fixed salary component to extract the rent workers achieve from the bonus. This did not happen in our case. Neither can the principal-agent model explain the endeavour the management made to negotiate a bonus scheme with the workers, nor the many concessions they made in order to implement a reform that was endorsed by the workers. A management behaving like a standard economic principal, facing a standard economic agent, ought to concentrate on getting the prices (bonuses) right. They should not be concerned with procedural fairness, or how the workers interpret the intentions behind the bonus scheme. These issues regarding the implementation and design of the reform are much easier to explain in models that extend the motivation of the employees. If workers are reciprocity motivated it can be in the strict self interest of the firm (management) to negotiate a reform that gives the employees considerable rents.

When we inquired about the generosity of the reform and about the consensus oriented process leading to the design of the reform, the management did indeed talk about the importance of creating ownership and a win-win situation in order to motivate the employees. But it also became clear that with respect to the process behind the implementation of the reform they did not have much choice. In order to implement a permanent performance pay scheme the company *had to* reach an agreement with the union representing the employees. The company was committed to these procedures by a treaty signed by the employer and employee organization of which this company was a member..But at another level the company had a choice since it could have implemented a temporary bonus campaign with the same content as the permanent incentive contract. In that case the management could have designed incentives without entering into any negotiations with the employees. That is exactly what the management did in 2004 when they decided not to renew the incentive contract.

Based on these observation we conclude that the principal-agent model predicts fairly well the design of the contract we examine. There are characteristics of the contract that does not fall directly out of the principal-agent model, but many of these features can be explained if we take account of institutional constraints that the management of the service unit operated

faced. For example, the management of the call centre preferred a tournament, and a cap on the sales bonus, in order to make sure that the cost of the program did not exceed the performance pay budget they received from the top management. And given that the management wanted to introduce a permanent performance pay program they were forced, by union agreements, to negotiate the shape of the reform with worker representatives.

## 5.2 Changes in the scheme

It is tempting to interpret the changes in the incentive scheme as the outcome of a rational learning process. The management implemented the scheme they thought would increase sales without degrading other services provided by the call centre. When they learned how the bonus scheme actually worked, they adjusted it to make it more effective. What did the management learn? Apparently, their main lesson was that the multi-task problem was tougher than anticipated. When they realized this the management took measures to curb dysfunctional behavior. The initial scheme was based on the number of sold insurance products, which, according to the management, induced the operators to offer insurance at a discount price to individuals with bad risks. To overcome these problems the management decided - in 2003 - to reward not only the number of products but also the profitability of sold insurance products. At the same time the management introduced a bonus associated with "quality of work" in order to avoid that the operators, being in a hurry to wrap up paperwork, made omissions and mistakes in the contracts that was sent to the customers. The management also introduced a bonus for improvements in the overall service level at the centre, which had fallen to a disastrous low level in 2003.

Why did not the management foresee these problems when they introduced performance pay? Perhaps they did not think through all the ways in which the operators could bend their behavior to take advantage of the bonus scheme? Or perhaps they hoped that reciprocity incentives would limit the problem, i.e. they hoped that the consensus and the generosity of the reform would prevent the operators from exploiting it. We do not know, but irrespective of the reason why the initial contract was incomplete the story above is one of rational learning; the management observed the operators behavior and updated their beliefs about the operators' type and the complexity of their jobs, and adjusted the scheme according to their new beliefs.

We believe this interpretation captures an essential element of the process.

But it is probably not the whole story. First, many of the changes were grounded on insufficient information. The management did not collect enough hard information about the profitability of sales, or mistakes made by the consultants, before they included these indicators in the scheme. They did not collect this information although the data were available. Hence, several changes in the scheme seem to be based on a vague notion, a hunch, that the initial contract generated certain dysfunctions that needed to be corrected.

Second, some of the performance indicators that were introduced at later stages do not square well with the decisions made by a rational, learning and self interested principal. The claims ratio, for example, was based on insurance products sold the previous year. This performance measure was operative in exactly one year, that is, it was abolished just at the time when it should start to bite. Likewise, linking the team bonus to the service level of the whole customer service centre (as was done in 2004) seems futile from this perspective, since each team only had only a small impact on this measure. There are also performance indicators at the team level that are highly correlated with the service level.

Hence, some of the changes that were made, and also the mere frequency of changes, indicate that in addition to rational learning there was an element of more or less blind groping for a functional scheme. Another explanation for the frequent changes in the design of the bonus scheme is that in a hierarchy of managers many individuals feel that they have to take initiatives and induce changes in order to signal strength and decision power.

## 6 Assessing the impact of the reform

In this section we present performance data. We describe *how* the operators responded to the introduction of performance pay, and *how* they adjusted their behavior to changes in the scheme. Finally we use our data to address *why* the operators responded as they did. We start, however, with a description of our data.

### 6.1 Data

Our data covers the period from week 38 in 2000 to week 52 in 2004. Phone data are automatically stored in a telephone base. Each incoming (and outgoing) call is automatically registered in this database. It contains information

about the duration of call, the waiting time and several other statistics. We have consistent data from 9 teams, and at the team level we have weekly data on

- Hours logged on
- Number of sold units
- Duration of a call (in seconds)
- Number of answered calls

In addition we have aggregate data for the service centre on;

- Total number of incoming calls
- Total number of answered calls
- The service level (which is an index that signifies how fast a customer that calls get in contact with an operator – the higher the service level the lower is the customers waiting time)

## 6.2 Descriptive statistics

To get a first impression of the impact of the reform, we compare performance before and after the reform in Table 1.

[Table 1 here]

In order to adjust for seasonal variations in the data we compare the same period before the reform and after the reform. There are three variables in Table 1 that need explanation. CPS is an acronym for calls per sale, it is the average number of calls needed to sell one insurance product over the relevant period. CPS is the inverse of  $p$  in the sales equation (1). The service level is a measure that captures the average waiting time for the customers that contact the centre. A service level of 80 implies that the average waiting time before a customer gets assistance is 20 seconds. A lower service level means a longer waiting time. Efficiency is the number of answered calls divided on the number of hours the operators are logged on the phone system. Recall that efficiency is one of the performance measures in the tournament between the teams.<sup>13</sup>

Comparing sales before and after the reform we find that sales are up approximately 15 %. Sales increased for two reasons, the teams answered

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<sup>13</sup>The outcome of the tournament was also based on the ratings from a random sample of customers. Since we do not have data on this variable in the period before the reform, we have not included it in the table.

more calls and they needed fewer calls to sell an insurance product (CPS dropped). Efficiency is also up after the introduction of the reform, but not primarily because the operators answered more phones, at least not from 2002 and onwards, but because they logged less on the phone system. Another pattern that stands out in the table is the decline in the service level over this period.

### 6.3 Empirical analysis of sales

Given that the aim of the reform was to increase sales, Table 1 indicates that it was successful. However, to make more confident conclusions we must control for other confounding factors that can explain the patterns we observe in Table 1. Operators can increase sales in two ways; answer more calls or sell insurance to a higher fraction of assisted customers (reduce CPS). To minimize the noise in our estimation of sales productivity we focus on the development in CPS. This measure does not depend on the number of incoming calls, nor on changes in a team's workforce. To assess the impact of the reform we run a fixed effect panel regression with CPS as the dependent performance variable.

Focusing on CPS as the performance indicator solves some identification problem but one major problem remains. CPS clearly depends on the relative attractiveness of the company's products. If this company spent more resources on marketing, reduced its' product prices, or something else happened that increased the demand for it's products, this would also reduce CPS, since those calling the centre would on average be more inclined to buy insurance. Hence a drop in CPS can either be caused by increased sales effort (or talents) of the operators, or by an increase in the demand of the products sold by the company. To control for changes in the demand for insurance products we include sales in other divisions, not affected by the pay reform (*sother*), as a control. We also included the number of incoming calls (*incalls*) and the service level (*slevel*) as explanatory variables.

Sales in other divisions and incoming calls are clearly exogenous to CPS. The relationship between CPS and the service level is more intricate. When the service level is low team leaders are instructed to focus solely on answering calls. Hence if these instructions are followed a low service level ought to increase CPS. But there is also a causal effect that goes the other way; if operators work hard and sell insurance to a higher fraction of customers they tend to be less available, due to paper work etc., for answering calls and this

will reduce the service level in the customer service unit.. To get around this endogeneity problem we regress CPS on predicted service level ( $\widehat{slevel}$ ), which is based on lagged values of the service level.

We find large productivity differences (variation in CPS) between the teams in our data. A possible explanation is heterogeneity in the skills of the team leaders. There has been three replacements of team leaders in our data, all happened in 2003. One team got a new leader in week 10, another in week 32 and the third team leader was replaced in week 38. We construct dummies denoted leader that is zero over the whole period for teams that did not change their leader. For the three teams that replaced their leaders this dummy is zero before the change and one thereafter.

The most general equation we estimate is given by

$$CPS_{it} = \alpha_i + \sum_{q=1}^{16} \mu_q quarter_q + \beta_i leader_{it} + \gamma incall_t + \nu sother_t + \lambda \widehat{slevel}_t + \varepsilon_{it}. \quad (3)$$

$CPS_{it}$  is the average number of calls needed to sell an insurance product for team  $i$  in week  $t$ . On the right hand side we have a team specific dummy, quarterly dummies for each post-reform quarter, a dummy that captures leader replacement, incoming calls, sales in other divisions, service level and an error term. Note that we use the predicted value of service level as an explanatory variable.<sup>14</sup>

Mean and standard deviations for the continuous explanatory variables are presented in Table 2. Table 3 and 4 give regression results for three variants of our empirical model. Model 1 in Table 3 contains only team specific effects (the  $\alpha_i$ 's), a dummy for the reform which is zero until week 8 of 2001 and one thereafter, a time trend and the controls discussed above. Team 9 is used as a reference category for the team specific effects. Thus, the estimated  $\alpha_6 = -0.589$  means that team 6 needs around 0.6 fewer calls per sale than team 9, all else equal. All team specific effects are statistically significant. Moreover, the pay reform reduced CPS significantly. The estimate of the bonus reform dummy is  $-0.74$ , which means that the pay reform reduced the number of calls per sale with almost 10 percent. The control variables have the predicted effect on CPS. An increase in incoming calls increase CPS; the more customers that are calling the less must the operators strive to reach

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<sup>14</sup>The estimated service level in period  $t$  is given by:  $\widehat{slevel}_t = \alpha + \alpha_i + \sum_{q=1}^{16} \mu_q quarter_q + \gamma incall_t + \nu sother_t + \beta_i leader_{it} + \sum_{j=1}^2 \eta_j lag_j(slevel) + \widehat{\varepsilon}_{it}$

the sales target. Sales in other divisions reduces CPS while the service level increases CPS.

[Table 3 here]

Model 2 extends Model 1 by including dummies for leader replacements. Interestingly, all leader replacement dummies are highly significant. Two replacements lowered sales productivity in the teams, while one replacement (team 8) induced a major improvement in the performance of that team. A thorough discussion of team leader effects is outside the scope of this paper, but we think it is interesting to note that the leaders seem to have such a significant impact on the productivity of a team.

Model 3 gives more detailed information about the change in sales productivity caused by the reform. In this model we have replaced the time trend and the reform dummy with quarterly dummies. The quarterly post-reform dummies are measured against the pre-reform period that runs from week 38 in 2000 until week 8 in 2001. Note that the first post-reform quarter is an extended quarter; it ranges from first week of March until the last week of June 2001. The estimates of the quarterly dummies are depicted in Figure 2.

[Table 4 and Figure 2 here]

The first result that stands out in Table 4 is the drop in CPS immediately after the incentive contract was introduced. This model suggest that approximately 13 percent fewer phones were needed in order to sell an insurance product in the second quarter of 2001, compared to the pre-reform level of CPS on 8.1. In the second and third quarter of 2003 there is an even larger drop in CPS. This apparent increase in productivity is due to the fact that the insurance company we study purchased the portfolio of customers from another company. Each contract in this portfolio had to be converted into the customer base of “our” insurance company. The consultants at the service centre were assigned to the job, but were reluctant to carry out the work. They argued it would impede their chances of reaching the sales target in the bonus scheme. To get the job done, the management agreed to let each converted insurance policy count as a sold insurance product. The conversion job started in March 2003 and lasted for approximately half a year. This then explains the large drop in CPS in the 2. and 3. quarter of 2003.

The third pattern that needs an explanation is the reduction in CPS that came during the second and third quarter of 2004 and that levelled off in the last quarter of 2004. We believe this increase in productivity came because the management individualized the sales bonus. However, we postpone further discussions of this change until the next section where we address what the data can tell us about the underlying motivation of the operators. At this stage we are simply interested in identifying the impact the performance pay had on sales productivity. To this end it is instructive to focus on the first quarters after the introduction of the reform. Based on the results we conclude that the pay reform caused a significant increase in the operators sales effort.

## 6.4 Agents or angels

The fact that the reform increased sales effort does not identify the underlying motivation of the operators. Selfish workers will increase their effort to sell insurance after the introduction of a sales bonus, but so will reciprocity and fairness motivated operators *if* they find the pay reform agreeable. There are indeed several indications that the operators appraised the reform to be both generous and fair: (i) The management pursued a consensus line; the reform was shaped together with worker representatives and the scheme was approved both by the management and the workers<sup>15</sup> (ii) The management added the bonus to the existing salary, which implied a substantial wage increase for the employees. (iii) The turn-over rate in the centre fell from around 20% before the reform to well below 10% after the reform. (iv) In a survey conducted among the customer service consultants a year after the pay reform, over 80% of the consultants reported that the bonus scheme had improved their work gratification. Hence, since the reform gave the workers both self- and other-regarding incentives to increase effort, the decline in CPS does not tell us anything about the aptness of the principal-agent model. .

In order to discern the underlying motivation that produced the drop

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<sup>15</sup>One could object that including the workers in the design process should not be taken as a sign of generosity and fairness as long as this procedure was dictated by a union agreement. But this is mistaken. The point is that the management could have bypassed the workers by using short term incentive campaigns instead of introducing a permanent performance pay scheme. This is what the management did in 2004 when they refused to renew the incentive contract.

in CPS, we need to look further into our data. One identification strategy is to consider to what extent the operators gamed and exploited the bonus scheme to their own advantage (and to the disadvantage of the firm). As noted in the theoretical section the principal-agent model predicts that the workers will exploit a pay scheme to their own advantage, irrespective of how fair and generous the scheme is. Standard economic agents disregard tasks that are not explicitly rewarded, and they try to find easy ways to improve indicators that are rewarded. Reciprocity and fairness motivation can mitigate the multi-task problem. Reciprocity motivated workers will, if they are offered a generous but incomplete or biased incentive scheme, improve their performance in a balanced way in order not to harm the company.

The frequent changes in the bonus scheme that described in section 5.2 (and in Figure 1) strongly indicate that the workers took advantage of the fact that the initial contract was incomplete. The management included profitability of sales as a performance measure to prevent the consultants from selling insurance to the wrong individuals (bad risks) at a discounted price. The management started to punish mistakes in the contract as an attempt to make the consultants pay more attention to the paper work that had to be done after a sale was registered. Finally, the management decided to withdraw from the negotiated contract because they suspected some of the teams to take advantage of the fact that they were compensated for sick absence among team members.

Another noteworthy pattern in Table 1 is the decline in the time operators were logged on the phone system in 2002 and 2003. This pattern reduced the service level at the call centre and this became a major concern for the management. Why did it happen? A plausible explanation is that the agents, after an initial period where they both logged more on the phone system and answered more phones, learned that they could increase *efficiency* simply by logging less on the phone system. Recall that *efficiency* was defined as the number answered calls *divided* on the hours logged on the phone system. In Table 1 we can see that in weeks 38 – 52 in 2002 and 2003 the consultants answered fewer phones, but their efficiency nevertheless increased because they were less logged on the phone system. This pattern is easy to understand from the principal-agent perspective, and it is well worth asking why the management defined efficiency in this way; why was efficiency defined as the number of answered calls *divided* on hours logged on the phone system; why not only as the number of answered calls. The management told us they had to define efficiency like this in order to induce the operators to

do work away from the phone system. Every now and then the customer service consultants had to do paper work or other work away from the phone system. In order not to punish teams that were instructed to log off the phone system the management, in negotiations with worker representatives, decided to divide the number of answered calls on hours logged on the phone system. Our conjecture, based on the data we have is that this arrangement was exploited by the teams; they logged off the phone system strategically, that is in order to gain terrain in the tournament, even though this reduced the service level in the call centre and harmed the company.

In order to examine this conjecture we run a fixed effects regression similar to model 3, but with hours logged on the phone system as the dependent variable. As explanatory variables we include a time trend, a dummy for the three last quarters in 2004 and we also control for service level, sales in other channels and incoming calls. We also include dummies for the conversion quarters.

[Table 4 here]

The time trend in hours logged on the phone system is negative and statistically significant, which confirms the pattern indicated in Table 1. There is a sharp negative deviation from this trend during the months when the consultants renewed the portfolio of insurance contracts that were acquired from another company. This is as expected; during that period many operators were taken away from their phones to convert the acquired portfolio into their own customer base. In the last three quarters of 2004 the management reduced the importance of efficiency in the bonus scheme. According to our conjecture the operators should then start to log more on the phone system. The dummy for the last three quarters is positive, but not significant. Taken together the results in table 5 suggest that the operators exploited the bonus scheme to their own advantage and to the disadvantage of the company. If the operators were strongly motivated by reciprocity and fairness concerns they would not take advantage of the scheme in this way.

Another way we can use our data to assess the importance of fairness and reciprocity motivation, is to consider how the workers' responded when the management left the consensus line and implemented a new bonus scheme by dictate. It is reasonable to evaluate this change as an unfriendly act by the management. Not only did the management deviate from procedural fairness, they also abolished compensation due to sickness absence. In addition the

management individualized the sales bonus. This move towards individual bonuses was against the will of the worker representatives, they preferred a team based scheme. Hence, if fairness and reciprocity are important motivations we should expect a subsequent drop in the workers sales productivity.

The new regime was introduced in the second quarter of 2004. If we look at Table 4 there is a large and significant *reduction* in CPS in the second quarter of 2004. CPS is also very low in the 3. quarter of 2004, but increases in the 4. quarter of 2004. But even in the last quarter of 2004 the productivity is high compared the last quarter in previous years. Our data then strongly indicate that the new regime increased the sales effort of the consultants. Hence, the customer service consultants reacted exactly opposite of what we should expect if their behavior were strongly influenced fairness and reciprocity considerations.

We do not have to stretch the principal-agent model very far in order to explain why the sales effort was higher under the new performance pay regime introduced in the second quarter of 2004. One of the key changes compared to the initial bonus scheme was the introduction of an individual performance bonus. In the second quarter of 2004 half of the sales bonus was based on individual sales, and half of it depended on team sales. In the third quarter the individual part was increased to three quarters of the total sales bonus. The principal-agent model would explain the increase in productivity as an alleviation of the free rider problem associated with a bonus that depended on team performance.

## 7 Conclusion

We have followed the evolution of a pay for performance reform over several years. We have collected detailed data, both on the design and impact of the reform. A first aim of presenting our case was to depict how difficult it is to use explicit performance bonuses in a multifaceted work environment. We think that both the complexity of the initial bonus scheme and its frequent amendment over time, underscores this message.

Our more ambitious goal was to use our data to assess the importance of other-regarding motivations, like fairness and reciprocity, at a workplace. The traditional economic framework used to study the design and impact of economic incentives presumes individuals that are completely self-regarding, individuals that only care about their own material welfare. This assumption

does not square well with the results from recent laboratory experiments resembling work relations, which show that principals and agents have social preferences that have important implications for the design and impact of economic incentives.

Our findings are mixed. We argue that the pay reform implemented in 2001 appealed to a broader set of motivations than the selfishness of the operators. There is, however, nothing in the operators' response that indicates a strong fairness and reciprocity motivation. On the contrary, we argue that their adjustment was totally in line with how rational self-seeking agents would respond to a pay reform. Our data also show that the management adjusted the initial pay reform as they learned more about the motivation and behavior of the operators.

Compared with recent experimental studies, which find that reciprocity and fairness are strong motivators in work relations, our results are surprising. However, we do not want to overstate this disparity. We are not claiming that other-regarding motivations, such as fairness concerns and reciprocity are non-existent or unimportant at authentic workplaces. A problem with case studies is validity: it is difficult to assess to what extent the patterns detected in one case generalize to other cases. There are certain idiosyncrasies associated with the workplace and pay reform we study that need to be taken into account before we apply our findings in a general discussion of reciprocity and fairness motivations at workplaces. For example, we study a workplace where the workforce is young and the turnover relatively high, which means that most of the employees consider their job as temporary. Furthermore, the degree of surveillance was very high also before the pay for performance reform was introduced. It is possible that this particular work environment does not foster other-regarding motivations, or that it systematically selects individuals that are not reciprocity and fairness motivated.

Another relevant point is that we study a reform where reciprocity and fairness incentives are paired with explicit performance bonuses. It is possible that the presence of explicit monetary incentives totally overshadows other-regarding motivations. If fairness and reciprocity incentives only work well in the absence of explicit performance bonuses, this is in itself an important observation that should be explored further. Our study then constitutes one piece in a broader program that examines how different institutions promote or prevent various kinds of motivations, and how these motivations interact with each other.

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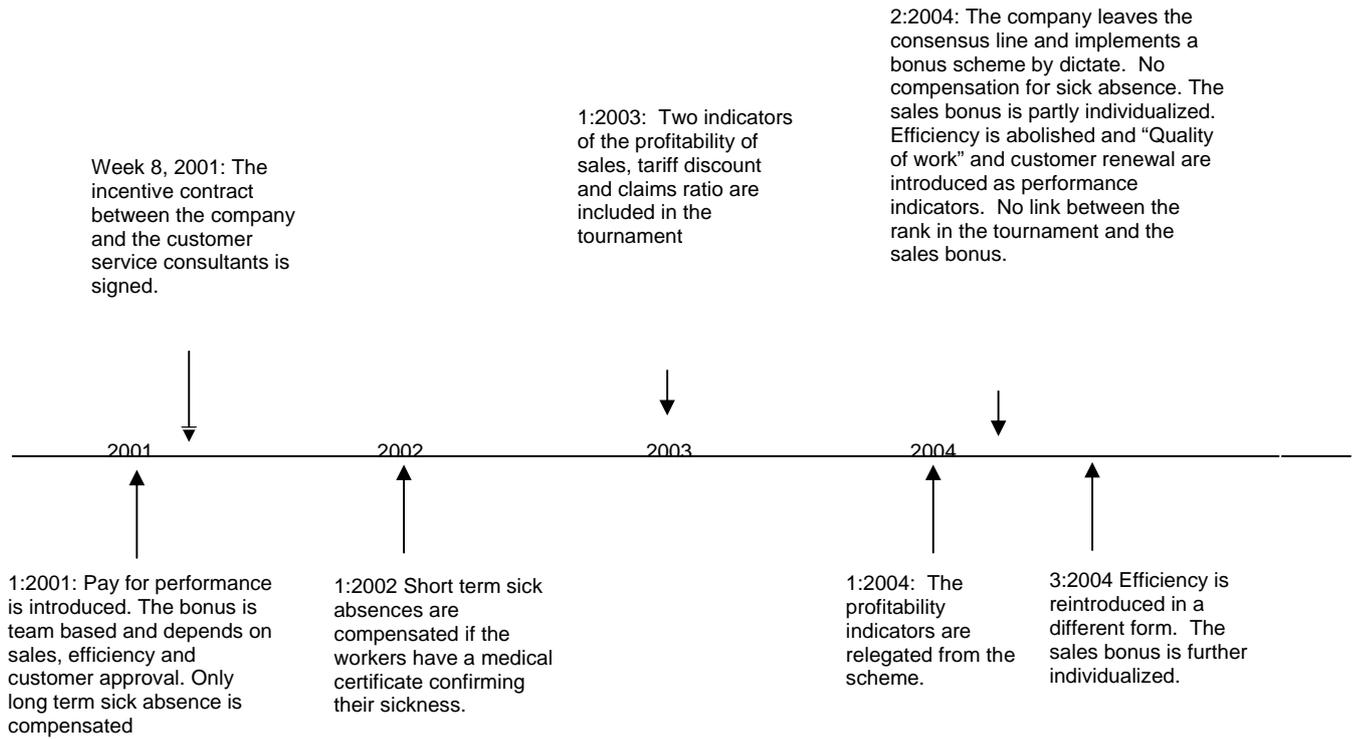
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**Figure 1: The evolution of the bonus scheme.**

The number preceding the year indicates which quarter the change was implemented.



**Table 1: The evolution of performance.**

Mean and standard deviation for 9 teams.

	<b>CPS</b>	<b>Efficiency</b>	<b>Hours logged on</b>	<b>Answered calls</b>	<b>Sold products</b>	<b>Service level</b>	<b>Incoming calls</b>
Week 38 2000 – week 8 2001	8.49 (3.32)	4.21 (0.53)	223.16 (48.75)	940.83 (232.30)	123.39 (46.54)	0.71 (0.08)	13600.70 (2075.44)
Week 38 2001 – week 8 2002	7.11 (3.13)	4.77 (0.72)	227.29 (61.23)	1063.11 (284.92)	167.13 (64.52)	0.66 (0.18)	15921.90 (3013.93)
Week 38 2002 – week 8 2003	7.76 (3.00)	4.58 (0.61)	222.06 (64.07)	1015.13 (297.49)	142.84 (53.07)	0.47 (0.28)	16804.70 (3174.74)
Week 38 2003 – week 8 2004	7.16 (1.75)	4.86 (0.77)	186.75 (52.92)	907.20 (264.33)	130.58 (40.91)	0.58 (0.17)	17149.00 (2700.73)
Week 38 2004 – week 52 2004	6.64 (1.53)	4.26 (0.64)	206.17 (44.34)	879.73 (231.21)	140.60 (52.19)	0.71 (0.09)	14685.50 (1413.17)

**Table 2: Explanatory variables.**

Mean and standard deviation for the continuous explanatory variables.

	Mean (Standard deviation)
Service level ( <i>slevel</i> )	.54 (.24)
Incoming calls ( <i>incall</i> )	16798.53 (3222.29)
Sales in other channels ( <i>sother</i> )	3999.53 (1197.92)
N	1998

**Table 3: Calls per sale before and after the reform.**

The dependent variable is calls per sale (CPS).

Data are from week 38 in 2000 to week 52 in 2004 for 9 teams.

Models are estimated with dummies for Easter and Christmas weeks (not shown).

<b>Explanatory variables</b>	<b>Model 1 Team specific effects and dummy for implementation of reform</b>	<b>Model 2 Team specific effects and team leader change dummies</b>
Team 1	-0.7646*** (0.0000)	-1.2227*** (0.0728)
Team 2	-0.3340*** (0.0000)	-0.3340*** (0.0000)
Team 3	-0.1474*** (0.0000)	-0.1474*** (0.0000)
Team 4	0.0098*** (0.0000)	0.0098*** (0.0000)
Team 5	-0.6679*** (0.0000)	-0.6679*** (0.0000)
Team 6	-0.5895*** (0.0000)	-0.5895*** (0.0000)
Team 7	-0.0713*** (0.0000)	-0.4930*** (0.0762)
Team 8	3.6915*** (0.0000)	6.8336*** (0.0970)
Implementation of bonus reform	-0.7425* (0.2927)	-0.9420** (0.2670)
Time trend	-0.0063 (0.0065)	-0.0025 (0.0022)
Leader change team 1	::	1.5364*** (0.2441)
Leader change team 7	::	1.3131*** (0.2373)
Leader change team 8	::	-7.3652*** (0.2274)
Service level ( <i>slevel</i> )	0.4887 (0.2152)	0.7082* (0.3040)
Inbound calls ( <i>incall</i> )	0.0000 (0.0000)	0.0001 (0.0000)
Sales in other channels ( <i>sother</i> )	-0.0001 (0.0001)	-0.0001* (0.0000)

Fully robust standard errors in parenthesis. \*\*\*Significant at 0.1 percent level, \*\*Significant at 1 percent level, \*Significant at 5 percent level.

**Table 4: Sales productivity quarter by quarter.**

The dependent variable is calls per sale (CPS).

Data are from week 38 in 2000 to week 52 in 2004 for 9 different teams.

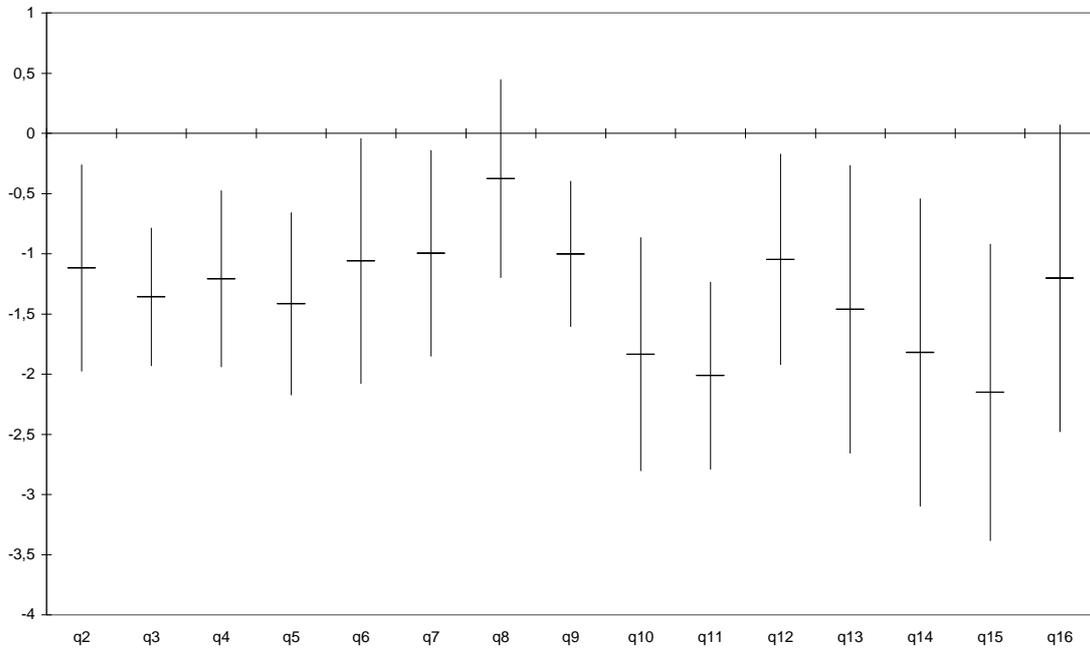
Team specific effects and dummies for Easter and Christmas weeks are included, but not shown.

<b>Explanatory variables</b>	<b>Model 3. Quarterly time dummies. No time trend</b>
Q2 (from week 8 to week 26 2001)	-1.1184* (0.3712)
Q3 (third quarter 2001)	-1.3591*** (0.2482)
Q4 (fourth quarter 2001)	-1.2082** (0.3176)
Q5 (first quarter 2002)	-1.4171** (0.3284)
Q6 (second quarter 2002)	-1.0615* (0.4418)
Q7 (third quarter 2002)	-0.9971* (0.3704)
Q8 (fourth quarter 2002)	-0.3761 (0.3564)
Q9 (first quarter 2003)	-1.0019** (0.2613)
Q10 (second quarter 2003)	-1.8351** (0.4201)
Q11 (third quarter 2003)	-2.0125*** (0.3369)
Q12 (fourth quarter 2003)	-1.0472* (0.3793)
Q13 (first quarter 2004)	-1.4615* (0.5181)
Q14 (second quarter 2004)	-1.8200* (0.5534)
Q15 (third quarter 2004)	-2.1523** (0.5333)
Q16 (fourth quarter 2004)	-1.2033 (0.5518)
Leader change team 1	1.6176*** (0.3027)
Leader change team 7	1.4328** (0.2872)
Leader change team 8	-7.1668*** (0.2612)
Service level ( <i>slevel</i> )	0.7120 (0.5489)
Number of inbound calls ( <i>incall</i> )	0.0001* (0.0001)
Sales in other channels ( <i>sother</i> )	-0.0002** (0.0000)
Constant	6.5858*** (1.0769)

Fully robust standard errors in parenthesis. \*\*\*Significant at 0.1 percent level, \*\*Significant at 1 percent level, \*Significant at 5 percent level

**Figure 2: Quarterly CPS.**

Estimated quarterly dummies in Model 3 – with a 95 percent confidence band.



**Table 5: The decline in hours logged on the phone system**

The dependent variable is hours logged on.

Data are from week 38 in 2000 to week 52 in 2004 for 9 teams. Team specific effects and controls for Easter and Christmas weeks are included, but not shown.

Explanatory variables	Model 3. Quarterly time dummies. No time trend
Time trend	-0.3224** (0.0814)
Q10 (second quarter 2003)	-20.4027 (9.0862)
Q11 (third quarter 2003)	-44.9412** (10.1478)
Dummy for three last quarters 2004	19.9156 (14.4543)
Leader change team 1	-12.5558 (7.8109)
Leader change team 7	14.8544 (8.2672)
Leader change team 8	-3.7933 (8.9348)
Service level (slevel)	106.7239*** (10.4289)
Number of inbound calls (incall)	0.0102*** (0.0005)
Sales in other channels (sother)	0.0019 (0.0014)
Constant	2.6142 (9.8018)

Fully robust standard errors in parenthesis. \*\*\*Significant at 0.1 percent level, \*\*Significant at 1 percent level, \*Significant at 5 percent level.



# NHH

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