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Evidence From Croatia**

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**Do Innovative Workplace Practices Foster Mutual Gains? Evidence From Croatia \***

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**Abstract**

New survey data for more than 470 employees (more than 80% of production workers) in a single Croatian manufacturing firm exhibits large variation in participation in innovative work practices (IWPs) notably online teams, offline teams, employee ownership, and incentive pay. Amongst IWPs, probit estimates reveal that membership in offline teams most often yields favorable outcomes for firms, notably enhanced provision of discretionary effort by employees and more likelihood of peer monitoring, as well as improved worker outcomes, including enhanced job satisfaction and higher employee involvement. Other IWPs usually are associated with similar favorable outcomes for firms and workers. Participation in sets of IWPs, that include offline teams and financial incentives, is found to yield benefits to both employees and firms. Our findings provide support for the proposition that IWPs will produce mutual gains and also help to identify key channels through which different IWPs work. Women also perceive that they are less empowered and report less willingness to engage in peer monitoring.

Key words: innovative work practices; employee ownership; Croatia; econometric case study.

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## **I Introduction**

There is abundant evidence that innovative work practices (hereafter, IWPs) of various kinds, such as teams, quality control circles, no-layoff policies, job rotation and employee ownership, have spread rapidly in developed market economies during the last thirty years or so. Between 1983 and 1993, Freeman, et al. (2000) report survey evidence that the number of non-monetary incentive programs offered by firms increased by 500% in the U.S. Similar trends appear to be at work in other countries including the UK (e.g. Wood et al., 2002), Japan (e.g. Kato, 2000), Denmark (e.g. Gupta and Eriksson, 2004) and Finland (e.g. Kalmi and Kauhanen, 2008.) While the corresponding evidence for transition economies is much slimmer, the available evidence is also suggestive that such practices are limited though spreading.<sup>1</sup> Unsurprisingly both theoretical and an empirical literature have appeared to examine the impact of IWPs on both business performance and employee outcomes. As different scholars from diverse fields in the broad area of industrial relations have applied varying approaches to explore several research questions, those literatures have grown rapidly. At the same time, while it is clear that analytical work of the kind that is becoming commonplace for advanced economies, work that focuses on developing and transition economies is very slim. Since it is important to determine whether findings for firms in advanced market economies carry over to other economies, the first contribution of this paper is to extend the geographical coverage of the empirical literature. This we do by assembling and analyzing new survey data set for a large Croatian manufacturing firm with our paper perhaps representing one of the first such investigations for a former communist economy.

Another reason why case studies of firms in transition economies is perhaps of special interest is that some have argued that the legacies of communism will help to shape and constrain contemporary labor-management relations in transition economies (e.g. Blanchflower and Freeman, 1997). At the same time, Croatia was once part of the Socialist Federative Republic of Yugoslavia (hereafter SFRY), in which a system self-management existed within a communist state. Such a legacy

means that examination of the potential of IWPs is perhaps of special interest. Finally, in many former communist countries, often privatization has been accompanied by significant employee and managerial share ownership in the firm at which they work. At our case in Croatia the process of insider privatization was facilitated by the creation of an ESOP and thus it is interesting to try to uncover the ways in which the ESOP and the legacies of self management and communism may help to shape both the design and the effects of IWPs at the case.

However the main contribution of the paper reflects key characteristics of the case and the nature of our data. Whereas most studies tend to examine cases in which attention is focused on one or two IWPs, our case is one in which several IWPs are present, notably offline teams, online teams, incentive pay and employee ownership. In addition there is much variation in participation in these practices amongst employees and also in membership in labor unions. Moreover our survey data has been designed so as to enable us to investigate the impact of IWPs on *both* firm and worker outcomes and to do so for a broader range of such outcomes than has typically been the case in much work in this area.<sup>2</sup> Furthermore, while IWPs are designed to bolster firm performance, the empirical evidence on their actual economic effects is often quite mixed.<sup>3</sup> Also, for the most part, there appear to be few studies that have endeavored to use such data to *directly* test hypotheses derived from economic theories such as the impact of IWPs on the nature and extent of peer monitoring and, more generally, on what the key mechanisms are by which different IWPs are expected to produce improvements in bottom-line performance.<sup>4</sup> Hence, in addition to providing evidence on worker outcomes, our survey has been designed to capture information for several other areas of interest that figure prominently in theoretical work, mainly by economists. These areas include the provision of discretionary effort by employees, the extent of horizontal monitoring, the degree of cohesion or cooperation within the organization, the extent to which employees are interested in product quality, and the degree to which employees have knowledge of and interest in their job and its relationship to company goals. In this

econometric case study,<sup>5</sup> we use these unusual measures that are derived from data we have collected using face-to-face surveys to investigate the impact of IWPs, such as employee ownership and participation in offline teams, for employee behaviors that are expected to affect firm outcomes.<sup>6</sup>

In turn we are able to investigate whether IWPs deliver benefits and, if so, whether these accrue to employees and/or employers and to determine whether there are mutual gains (Applebaum et al. 2000). Furthermore, given the importance many have attached to packages of IWPs (e.g. Ben-Ner and Jones, 1995), our data enable us to begin to see if there are varying effects to different combinations of IWPs and to see if conclusions reached using data for other cases (with more restricted combinations of IWPs) carry over to this case in which a rich set of IWPs is present.

The structure of the paper is as follows. In the next section we briefly review theory and empirical evidence. Then we overview the case study and its environment and also describe our most unusual data. In the next two sections we examine the impacts of these practices on outcomes for workers and the firm. In the final section we summarize our findings and offer some concluding comments.

## **II Conceptual Framework and Empirical Literature**

We continue by reviewing theoretical and empirical literature as it mainly concerns relationships between IWPs and firm outcomes. This is interwoven with a brief review of the corresponding literature that concentrates on the impact of IWPs on worker outcomes. In both areas we note that often the picture is muddled with theoretical work in particular tending to yield ambiguous predictions as to the impact of IWPs. Since ours is not a theoretical contribution, here we merely highlight some key themes and focus on those theoretical issues that are most pertinent for our case. In particular we discuss ways in which theory suggests that the key IWPs at our case, namely different kinds of teams, employee ownership and incentive pay, might have potential impacts on important

aspects of individual behavior. While we concentrate on theoretical issues relating to the expected impact of *individual* IWPs such as teams, we also examine theory concerning the potential payoffs to *combinations* of IWPs.

So far as the literature on firm outcomes is concerned, much literature recognizes that the organization of the firm matters for employee behavior (and thus ultimately on firm performance) and thus is necessary to go inside the “black box” that is usually ignored in simple micro-economic theory. Broadly speaking we may distinguish mechanisms that focus on the effect of IWPs that emphasize financial participation, such as employee ownership, from those that stress employee involvement and skills, such as teams.

Labor contracts are necessarily incomplete, providing opportunities for opportunistic behavior by employees and employers. Since the interests of employers and employees may not be aligned, the degree of effort expended by employees is a variable, rather than something that is fully specified in a labor contract. In turn, a literature has emerged that shows how the degree of effort may be affected by particular IWPs such as teams and how these relationships may be affected by other aspects of the firm’s institutional set up with a substantial body of theoretical work concerning “team production”, and also a related literature on “teams”.<sup>7</sup> This literature on “team production” is concerned with the provision of incentives in situations where team output can be observed but individual productivity is unobservable. Dividing the output equally between team members leads to well-known free-rider problems. The early literature concluded that the presence of an outside party is necessary for team production to function, either in performing a monitoring function (Alchian and Demsetz, 1972) or acting as a “budget breaker” (Holmström, 1982). Among subsequent works, the most relevant for our purposes is the literature stressing the role of horizontal monitoring.<sup>8</sup> It has been argued that monitoring functions can be performed more efficiently by employees who observe each other’s work effort on a continuous basis (Putterman, 1984). Similarly, it has been argued that teams can achieve first best

outcomes once they develop norms against shirking (Kandel and Lazear, 1992).

By “teams” we refer to mainly to work practices in online teams whereby employees work in groups rather than individually and they also have some discretion over their working methods. According to this definition, to some degree, teams have internalized the monitoring function and thus may be less subject to the free rider problem associated with team production. Incentive problems are not the only problems facing teams. Teamwork, both in online and in offline teams, usually involves regular meetings between team members that are not used in productive activities. Teams may also increase employee expectations about increased discretion. If these expectations are not fulfilled, it may create frustration and lower work morale (Heller et al. 1998).<sup>9</sup>

While there are distinct costs associated with working in teams, several authors have suggested that in many situations the advantages outweigh the costs and many have stressed that teams are expected to be associated with improved supply of effort. Thus the important question to understand is it that employees develop norms that protect from shirking and other undesirable side effects of team work. Disciplining of co-workers is likely to inflict psychological costs on employees, and therefore it is not likely that they would engage in it without additional inducements (Freeman et al., 2004). Increasing employee discretion without providing incentives for effort may produce detrimental effects: for instance, employees within autonomous teams that have wide discretion on production methods and the pace of and may use this discretion to work at a more leisurely speed.

If production technology can be characterized mainly as team production, then pay structures tied to individual performance cannot be used. Two relatively widely used alternatives are company based profit-sharing and employee share ownership schemes. Workers who receive more flexible pay are expected to be more committed to their firm, to work harder and smarter and to be more likely to engage in the accumulation of firm-specific human capital. And there exists fairly consistent evidence that these schemes have modest but positive performance impacts.<sup>10</sup> However if employees are

members of offline (rather than online) teams, then pay structures tied to individual performance can be used.

It is also apparent that the willingness to engage in horizontal monitoring may vary between union and non-union environments. And the degree of cohesiveness or extent of cooperation between labor and management may be expected to vary between union and non-union forms (though the direction of this effect may vary depending on one's view of unions—contrast Freeman's (not so) new view of unions with the traditional view.

As briefly previously discussed, many stress the need for complementary initiatives. For example, Ben-Ner and Jones (1995) point out that employee involvement alone may not lead to enhanced business performance, especially in the absence of increasing return rights. The coupling of return rights with teamwork may provide the right incentives to engage in peer monitoring and also to withhold from opportunistic use of increased discretion. Several other authors, including Ichniowski et al., (1997) and MacDuffie (1995), suggest that combinations of various IWPs may be more effective than individual practices. However this is not a universal position with, for example, Goddard arguing against this conclusion. Godard (2004) also stresses the role that institutional conditions, notably union attitudes, might play for workplace innovations to be effective. And even amongst those who argue for benefits flowing from combinations of IWPs, disagreements exist on matters such as what exactly constitutes the best set of practices.

Turning to the literature on worker outcomes, since there are very good recent reviews on this matter (e.g. Handel and Levine, 2004) our review will be quite brief. As with outcomes that are apt to be of main interest to employers, again there is no consistent picture in the literature as to whether IWPs are expected to deliver benefits to employees. One camp is often optimistic that workers (as well as employers) may benefit from IWPs. Thus Applebaum et al. (2000) argue that that there are complementarities between IWPs that provide incentives, opportunities for participation and for skill



formation. In such circumstances they predict that there will be mutual gains as both employees and employers benefit. This view is shared by Freeman et al. (2006).

By contrast there are many who are much more pessimistic and who expect that workers may suffer in such high performance workplace environments. For example Goddard (2004) and Ramsay (2000) take this view. They expect that employees will not benefit materially from IWPs and that job stress will be apt to increase. In addition, as many have noted, IWPs may disappoint, and ultimately backfire, because of difficulties related to implementation.<sup>11</sup>

### **III The Croatian Context, The Case and the Data**

While generalizing from case studies is always potentially a risky undertaking, in the case of a Croatian firm, one must be especially aware of the limitations that might be imposed arising from the heritage of the Yugoslav system of self-management as well as the transition process itself. Equally, since the research was undertaken more than 15 years after the end of self-management, it is clear that many workers at the case would have no direct experience of the self-management model. While attitudes towards some IWPs (such as the ESOP) might be affected by experience of that earlier system, it is difficult to believe that such influences will be powerful after such a long passage of time. So far as the transition process itself is concerned, we note that ESOPs are not an uncommon institution in Croatia. In the only attempt to systematically survey the incidence of ESOPs in Croatia, Tipuric et al. (2004) note that ESOP and ESOP-like models existed in 9.4% of enterprises. In their discussion of privatization Goic, Vazarsak and Brnabic, (2006) also note the use of the ESOP model during privatization in Croatia. Hence, insofar as there were many other similar ESOP cases in Croatia during the transition period, the case firm, ADP Plastics (hereafter ADP), is far from unique in Croatia. Equally, it is also clear that the typical pattern of enterprise transition in Croatia did not involve an ESOP.<sup>12</sup>

Several kinds of data were collected from ADP. Most important are face to face data from surveys of workers. In addition several interviews were conducted with diverse personnel, including ADP managers and union representatives. Finally, additional information was drawn from other sources such as annual reports and other internal documents.

The firm which is listed on the Croatian stock market is quite important in the local economy. It is headquartered in Split and one major plant has been located there for more than 50 years. The firm has multiple plants and has established a solid market niche in the broad area of manufacturing plastic products, with a focus on high-quality plastic parts for the automobile industry. During the 1980's, when Croatia was part of the SFRY, what is now ADP was part of a larger group of companies that employed as many as 13,000 employees. ADP emerged as an independent company during transition and the disintegration of the SFRY when the original company was split into several parts. ADP is one of the few large industrial companies in Croatia that has managed to successfully navigate the problems posed by transition. An ESOP was established in 2001 as part of the privatization process; the aim was to transfer the bulk of ownership to employees and management, and to avoid a takeover of the firm by a foreign company. Currently about 53% of the firm is owned by the ESOP, and individual employees and managers still control a majority of votes (in fact, around 60%). with the majority of the balance owned by another corporate entity that is a long time strategic partner of ADP.

ADP is part of a larger group, namely the AD Plastik Group that includes ADP and several smaller companies some of which are located in Slovenia, Romania and Russia. Recently overall employment at ADP has averaged about 1300 while employment in the group has fallen from 2073 in 2003 to 1974 in 2005.

More than 90% of ADP's output is exported mainly to customers in Western Europe. The company is doing well and sales have tripled during the last three years and data for several plants show that plants have recorded sustained growth over even longer periods. Investment is at high levels

and is reported to average in recent years between 12 and 30% of sales. At the same time, the firm faces an environment that is increasingly challenging. Before 1990 most of its plants tended to face mainly domestic competition (within the SFRY) and had comfortable profit margins. More recently, managers perceive that these margins have become quite thin and that competitive pressures have grown, usually from overseas competitors.<sup>13</sup>

Many, including Appelbaum and Batt (1994) argue that globalisation and regulatory changes that have increased competition have compelled firms to consider means for improving productivity by the application of advanced IWPs such as total quality management or autonomous teams. Such pressures appear to have played a part in the introduction of IWPs at our case. Indeed in interviews with managers many mentioned that they faced growing competitive pressures in the 1990's in their product markets and tougher standards for product quality from their customers, including requirements for IOS certification. Accordingly the firm has been required to make strategic responses to a fast changing situation. Such pressures to change were felt especially strongly after the disintegration of the SFRY. They have been sustained in more recent times as Croatia prepares its candidacy for entry in to the EU.

Our interviews also indicated that the case uses a number of IWPs including offline teams, online teams, incentive pay as well as the ESOP.<sup>14</sup> During one site visit we observed online teams in one department with each containing from 10-12 and mainly female workers. Offline teams are reported to have existed for many years. It appears that team practices at ADP, especially offline teams, were generally well regarded by management. So far as offline team membership is concerned it appears that line-and top-management usually selects members. These teams serve mainly as "task forces" with tasks including developing new products, implementing new technologies, and general issues surrounding interplant and interdepartmental cooperation.

ADP has other practices that provide for extensive information sharing, including quarterly meetings and a monthly newsletter. During quarterly meetings, the labor force learns confidential corporate information concerning new products, new strategies and financial statements. In addition employees receive a monthly newsletter in which they are informed about developments at the firm.

Turning to financial matters, it appears that ADP provides higher starting wages than other comparable firms. In addition ADP has a long history of financial participation and the system of incentive pay has existed for many years, while the ESOP has been in place since 2001.

At the same time, it was apparent that the firm did not have accurate information on the extent to which employees participated in many of these IWPs. Similarly, while a strong union is also present in the firm, estimates varied as to union density at the firm.

To provide more accurate information both on the incidence of these IWPs as well as their effects on employee attitudes towards and behaviors resulting from these IWPs, we administered a survey in face-to-face interviews with individual employees. By surveying employees at two plants, we were fortunate to collect more than 470 surveys, which give us an impressive response rate of more than 80%.<sup>15</sup>

From Table 1 we see that the average worker at ADP is 39 years old and has worked at the firm for more than 11 years. About half of the workforce is female and about two in three are currently married. There is a wide spread in the highest level of educational attainment. While 12.6 % of workers have completed a four year degree course, almost 10% of employees did not even complete grade school.

The descriptive statistics reported in Table 1 also indicate that there is wide dispersion amongst the labor force in their participation in IWPs. On average between 42.8% and 67% of employees participated in one of the four key IWPs that we have identified. The highest rate of participation is in offline teams (67%) while fewer than 43% report that they are in an online team. However for those

who are in an online team, more than 58% of respondents report that they belong to teams that are self-managed. About half of the respondents were union members. The last row of Table 2, part B provides additional information on the incidence of participation rates in combinations of IWPs within ADP. Again we observe much dispersion in participation rates in these practices. We see that 65 employees (about 14% of respondents) were in both offline teams and the ESOP; however, 137 (about 30%) were in neither plan. By comparison, 99 employees (about 21% of respondents) were in both online teams and the ESOP, while only 80 employees (about 17%) did not participate in either plan. The last two columns provide information on the extent to which there was participation in all four practices by employees at ADP. Interestingly 28 employees (about 7% of respondents) report that they were in both online and offline teams, as well as the ESOP, and also received incentive pay. By contrast 53 workers (11%) report that they were in no practice. Or, in other words, almost 90% of employees participated in at least one IWP.

#### **IV The Effects of IWPs on Firm and worker outcomes: Simple Hypothesis Tests**

To provide evidence on the impact of IWPs on firm and worker outcomes we begin by comparing a wide range of outcomes for participants and non-participants and conducting simple hypothesis tests. Since some of our interests are in what is a relatively new line of inquiry, the available literature with which to guide our research is rather limited. Hence often we employ alternative measures for key ideas—for example, to measure discretionary effort we use measures of both absolute and relative effort. We proceed in two steps. First, in Table 2A the method is to focus on only one IWP at a time. We compare outcomes for those who are (are not) members of: (i) offline teams; (ii) online teams; and (iii) the ESOP. Finally, for the subset of workers who are in an online team we examine whether it matters to be in a self-directed team.

Next in Table 2B, and reflecting our interest in the effects of combinations of IWPs, we identify

four interesting sets of IWPs within the case.<sup>16</sup> For example the first combination is for those who participate *both* in an offline team *and* the ESOP; outcomes for that group are compared with those who participate in *neither* offline teams nor the ESOP. In the final set of such comparisons we compare outcomes for those who participate in all core practices --in online teams, in offline teams, in the ESOP and in the incentive pay scheme-- with those employees who do not participate in any of these practices. In all exercises findings are reported under several categories of outcomes. While many of these dimensions are reasonably standard in the literature, namely empowerment, communication, commitment, trust, job satisfaction, intrinsic rewards and job stress, others are more novel, particularly effort and teamwork/peer monitoring.<sup>17</sup> In all of these exercises we use t tests on means to determine if there are statistically significant differences in outcomes for employees who do/do not participate in the IWP or set of IWPs.

We continue by first discussing the findings reported in Table 2A. From the first two columns of Table 2A it is clear that membership in an offline team by itself tends to be associated with both enhanced worker and firm outcomes. For most categories, statistically significant differences exist between members and non-members for the bulk of questions within each block. Thus both questions concerning empowerment indicate that offline team members believe that they are more empowered than those who are not in such teams. A similar picture prevails for four of the five questions concerning different ways of capturing communication. By using two measures of effort as well as data on hours worked, members in offline teams report that they work harder and longer than do their peers who are not in such teams. The data on offline teams in Table 2A also show that team members are more committed to the company than those who are not in such teams, are more trusting of the firm, have higher levels of job satisfaction and they experience higher levels of intrinsic rewards.. Furthermore members of offline teams are much more likely than those who do not belong to offline teams to engage in peer monitoring—to say something to a worker who is slacking off. The only area

in which offline team membership is not associated with a statistically significant enhanced worker or firm outcome is job stress where no differences are apparent.

Based on the data reported in the three remaining three sets of columns in Table 2A, we make two observations. First, in some cases we observe that it is another practice that appears to be having a bigger effect on an outcome than does participation in an offline team. For example, compared to membership in an offline team, membership in a self-directed online team is observed to have larger effects on several outcomes concerning communications. Second, in the main, the general pattern observed for offline teams carries over to the other practices for which we report evidence. However, the evidence is not quite as compelling. Thus membership in the ESOP does not reveal marked differences concerning commitment, and online team membership is not linked with many significant differences concerning teamwork/peer monitoring. Also while belonging to a self-directed team usually is associated with more teamwork and more peer monitoring, this is not found for all questions. At the same time in the bulk of instances the findings reported in Table 2A indicate favorable worker and firm outcomes for participants. Consistent with those who hypothesize that IWPs will deliver benefits to both workers and firms we also find that participants in all of the IWPs communicate more often than do non-participants with managers and supervisors outside of their work groups or teams and also communicate more often with workers outside of their work groups or teams. Participants in all practices are also found to put more effort into their work and are more satisfied with their work. Again there is no evidence that stress levels differ for participants and non-participants in the other IWPs.

In Table 2B we turn to combinations of IWPs. The evidence is broadly supportive of predictions that combinations of IWPs will be expected to be associated with better worker and firm outcomes (compared to situations when there is no participation at all.) In the first eight columns of this table we offer pairwise comparisons for outcomes for employees who are in a pair of IWPs alongside those who are in neither practice. Thus from the first two columns, where we contrast outcomes for

those who are (are not) in an offline team and an ESOP, we see that in consistent evidence that this pair of IWPs is associated with favorable outcomes for workers and for the firm. For most categories, statistically significant differences exist between members and non-members for the bulk of questions within each block. Workers who are in offline teams and in the ESOP report that they are more empowered, engage in more frequent communications, are more committed, have more job satisfaction and have higher intrinsic rewards. They also work harder and undertake more peer-monitoring.

When we consider the impact of membership in offline teams together with incentive pay, the results are virtually identical to those found for participation in an offline team and an ESOP. By comparison with findings for the ESOP-offline combination, findings for the offline-incentive pay combination are slightly weaker only in the area of commitment. But again in most categories, statistically significant differences exist between members and non-members for the bulk of questions within each block. Workers who are in offline teams and who also receive incentive pay, report that they are more empowered, engage in more frequent communications, have more job satisfaction and have higher intrinsic rewards. They also work harder and undertake more peer monitoring.

Very similar patterns of effects prevail concerning outcomes for the remaining pairs of IWPs. When we consider the impact of membership in online teams together with either participation in the ESOP or receipt of incentive pay, the results are virtually identical to those found for combinations involving participation in an offline team, especially the pair including participation in the ESOP. Moreover, the findings are virtually unchanged when we contrast outcomes for those employees who are in *all* practices with those who are belong to none (findings are reported in the last two columns of Table 2B.)

In sum, the evidence presented in both parts of Table 2 provides good support for the general proposition that IWPs are associated with better worker and employer outcomes—IWPs can deliver mutual gains. The analysis indicates that when workers participate in IWPs, they develop a stronger



sense of empowerment, achieve more intrinsic rewards from their jobs as well as higher levels of job satisfaction. In turn, these empowered and more satisfied workers tend to trust management more and develop stronger commitment to the firm. These attitudinal changes are accompanied by behavioral changes. When workers participate in IWPs they tend to have more open and more frequent communication with management (as well as with their coworkers), exert more effort (shirk less) and engage in more peer monitoring (or horizontal monitoring). Finally, IWPs are not associated with increased stress. As such IWPs appear to offer a strong point of hope, even in firms that face a difficult environment, such as those in transition countries.

## **V The Effects of IWPs on Firm and worker outcomes: Multivariate Analysis**

To see if the conclusions yielded in the exercises reported in the previous section carry over once we introduce additional controls, we estimate a variety of ordered probit models concerning diverse employer and employee outcomes. In essence we estimate three sets of models for each of thirteen outcomes when outcomes are grouped into six sets, including *discretionary effort, monitoring, employee involvement, job satisfaction and intrinsic rewards*. In the baseline models, as well as controls for personal characteristics (tenure, age and gender), we include only one IWP.<sup>18</sup> Besides our four core IWPs (offline teams, online teams, ESOP and incentive pay), for the subset of workers who are in offline teams we also consider whether it matters to be in a self-directed team. We are also able to investigate the impact of union membership in a similar fashion. The remaining two sets of probits reflect our interest in the impact on worker and firm outcomes of *combinations* of IWPs. In the second set of exercises, we investigate the influence of several *pairs* of IWPs that we have previously examined using simpler methods. Reflecting our earlier theoretical discussion these are constructed so as to combine membership in one type of team alongside some mechanism for financial participation. In the last sets of exercise we include information on all four IWPs and then, in separate regressions,

we also consider the effect of union membership as well as all four IWPs. In Tables 3-15 we report the coefficients that emerge from these exercises. The final task is to report selected marginal effects in order to see if the effects that we uncover are not only statistically but also economically significant.

### *Discretionary Effort*

The results reported in Tables 3 and 4 are for two alternative measures of discretionary effort—the measure used in Table 3 is a measure of *absolute* effort while that in Table 4 attempts to get at *relative* effort.<sup>19</sup> From the set of models reported in the first six columns of Table 3 we see that there is evidence that teams of both types enhance the provision of effort, and that this is also the case for incentive pay. By contrast, neither union membership nor participation in an ESOP is found to have a statistically significant effect on the supply of discretionary effort. In the models reported in columns 7-10 we examine the impact of pairs of practices. We see that membership in an offline team enhances the supply of effort in both models (columns 9 and 10), though in these cases there is no additional impact from financial participation. In the other two regressions, in one instance online team membership is associated with more effort, other things equal, while in the other case only incentive pay (and not online team membership) has a positive impact on the supply of effort. As in the most restricted models, neither union membership nor participation in an ESOP is found to matter for the supply of effort. The final set of models includes all IWPs. Reassuringly we still find that offline team membership enhances the supply of effort, though now no other IWP or union membership has an effect.<sup>20</sup> In addition, and as in all other models reported in Table 3, we observe that, having controlled for tenure, it is older workers that report that they supply more discretionary effort.

Turning to Table 4 the key finding is that, as with the results for absolute effort reported in Table 3, membership in an offline team is consistently found to enhance effort supply. This is found in all specifications, both those in which that IWP is included alone (column 2) or alongside other measures of financial participation (columns 9 and 10) and in the fully augmented models reported in

the last two columns. In addition, and unlike findings reported in Table 3, in all models we find that membership in an ESOP will enhance the provision of effort when effort is measured in this relative way.<sup>21</sup> For this measure of effort, the fully augmented models provide evidence that some of the remaining IWPs, notably online team membership, also matter for effort supply, though this does not often show up in the more parsimonious specifications.<sup>22</sup> As in Table 3, we find that older workers report that they work harder. In addition, the negative and significant coefficient on gender means that in many specifications there is evidence that men believe that they are more likely than are women to work harder.<sup>23</sup>

### *Monitoring*

In Tables 5 and 6 we report evidence on the impact of IWPs concerning, respectively, whether respondents *have engaged* in horizontal monitoring and also their *willingness* to horizontally monitor. The results reported in Table 6 are particularly striking. There we find that membership in both online and offline teams is associated with a greater willingness to engage in horizontal monitoring. To some extent this finding is mirrored for offline teams since, in some specifications reported in Table 5, we observe statistically significant and positive coefficients for that IWP.<sup>24</sup> For the most part no other IWP is found to affect monitoring. Also the results for some controls reveal an interesting story. They indicate both that women are typically softer on monitoring (compared to men) and also that older workers are apt to monitor more.

### *Employee Involvement*

In the following two tables (Tables 7-8) we turn to the first measure that relates to a worker outcome, namely empowerment (decision-making ability, reported in Table 7) or employee involvement (measured by my say in what happens on my job, and reported in Table 8.) In several respects the two measures yield similar results and findings. A clear picture emerges that all IWPs enhance employee participation, both alone and in combinations. This is perhaps most evident

concerning the impact of offline teams. For both measures of employee participation we find that in *all* specifications offline teams lead to employees perceiving that they are more empowered. This pattern is also essentially repeated concerning ESOPs. Findings are also reasonably strong concerning the other two IWPs, the incentive system and online teams. In all specifications reported in Table 8 the incentive system is always found to be an IWP that enhances the average employees' sense of empowerment; in Table 7 this is frequently the case as well. For online teams the evidence of positive effects is a little spottier.

The evidence reported in Tables 7-8 also indicates that union membership does not play a role in accounting for differences in perceived levels of participation. Finally, so far as employee characteristics are concerned, the coefficient on gender is consistently positive in both sets of findings thus indicating that it is men, rather than women, who report that they have a greater say in their job, even after controlling for benefits for participation that flow from IWPs. While cultural differences between men and women presumably play a role in accounting for this difference (and other gender differences in outcomes), an interesting line of inquiry would be to pursue the reasons for these differences more thoroughly.

### *Job Satisfaction*

In Table 9 we report findings on the relationships between IWPs and job satisfaction for our case, ADP. For membership in offline teams, participation in the ESOP, and receiving compensation in part through the incentive system the evidence is very strong that each of these IWPs alone as well as in combinations is associated with enhanced job satisfaction. This is the finding for these three IWPs in all specifications. For online teams the evidence is also strong, with coefficients on that variable not attaining customary levels of statistical significance only in the fully augmented models that are reported in columns 11 and 12.<sup>25</sup>

While the pattern of the findings on job satisfaction thus mirrors some of the results reported for

other outcomes for workers and the firm, there is an important difference in the factors that account for differences in job satisfaction. From Table 9 we see that membership in a labor union is also found to enhance job satisfaction--no similar effects of union membership were observed for other outcomes. There is also a novel finding concerning one of the controls, namely for tenure, for which the net positive coefficient implies a negative effect on job satisfaction for longer tenured workers. As with empowerment, men report more job satisfaction than do women, other things equal.

#### *Communications, Commitment and Teamwork*

In Table 10 we report findings for the impact of IWPs on communications. Again there is evidence that IWPs play a role in accounting for variation in this employee outcome. This is especially the case for both types of teams for which, except in the fully augmented models, team membership is always found to matter at customary levels of statistical significance. There is also some weaker evidence that participation in the incentive plan is associated with greater frequency of communications between respondents and other groups. By contrast participation in the ESOP (and union membership) play no role. As for controls, the positive coefficient on gender means that women report that they are apt to communicate less frequently than men.

The evidence reported in Table 11 offers quite strong and additional support for those who hypothesize that high performance workplace practices such as teams and mechanisms for financial participation will deliver improved outcomes for employees. In all specifications reported in table 11 it is the case that membership in offline teams and participation in the ESOP is associated with employees reporting higher levels of commitment to the firm. The evidence is also reasonably strong that membership in online teams leads to improved commitment while, for incentive pay, there are also some indications that this too plays a role. By contrast, union membership has no effect one way or the other. Since the net tenure coefficient is positive our results also indicate that workers who have longer tenure have weaker commitment to the organization.

Compared to some of the findings emerging from the other tables, the evidence on the impact of IWPs on the likelihood of employees engaging in team-like behavior (as they assist their peers in various kinds of on the job training) and reported in Table 12, is relatively weak. As with many other outcomes it is offline team membership that is found to have the clearest and most consistent effects, with membership in an offline team enhancing the likelihood of employees assisting other employees in on the job training. While the evidence for other IWPs is patchier, nevertheless such evidence is present and is especially evident in the preferred specification (column 11) when, beside offline team membership, teamwork is also facilitated by membership in the ESOP. However, and rather surprisingly, we also find that online team membership tends to undermine team-like behavior. The evidence also indicates that tenure and age play significant roles in accounting for differences in the propensity for employees to engage in team-like behaviors. Thus the net positive coefficient implies that workers with longer tenure are apt to engage in less team-like behavior, as are older workers.

#### *Intrinsic Rewards*

The findings reported in Table 13 and 14 offer evidence on the role of IWPs concerning intrinsic rewards. In Table 13 this is measured by how well employees regard their job as making use of their skills and knowledge while in Table 14 we look at the importance of what workers do at work relative to what they earn. For both measures of intrinsic rewards again we find that the HR practice that appears to enhance this outcome in the eyes of employees is membership in most specifications in offline teams, though other IWPs are found to be statistically significant in the fully augmented specifications reported in columns 11-12. However, when intrinsic rewards are measured by knowledge and skill (Table 13) membership in online teams arguably plays an even more consistent role than does offline team membership. In both cases, IWPs that provide for financial participation typically do not appear to have much effect, though the ESOP variable is statistically significant in the specification reported in column 8. So far as controls are concerned, for this outcome gender appears to be playing

the biggest role.

### *Trust*

The last outcome we investigate is Trust for which we report findings in Table 15. Perhaps surprisingly in view of our earlier findings it is policies that promote financial participation that loom largest in the specifications reported in Table 15.

The final task in the section is to compute and report marginal effects in order to see if the effects that we uncover are not only statistically but also economically significant. In order not to overwhelm the reader (and to keep the number of tables that we report to a manageable number) we do this on a selective basis. One set of illustrative exercises is to compute selective marginal effects concerning the willingness to horizontally monitor. When this is done we find that the magnitudes of the effects typically are economically significant but not that large. Thus if I am not a member of an offline team (rather than a member) then the probability of my strongly disagreeing with the statement concerning my willingness to horizontally monitor is calculated to be 1.9 percentage points higher (category 4), 10 percentage points higher (category 3), 6.5 percentage points lower (category 2) and 5.4 percentage points lower (category 1). As we have already noted, the evidence reported in Table 6 also suggests that women are less likely than men to be willing to monitor. Furthermore we find that, compared to a man a woman has a 5.6 percentage points lower probability of strongly agreeing with the statement concerning willingness to horizontally monitor (category 1), and a 2.1% higher probability of strongly disagreeing with the statement concerning willingness to horizontally monitor (category 4).

In sum, the evidence presented in Tables 3-16 reinforces findings from the simpler hypothesis-testing evidence reported in Table 2. Often there is pretty solid support for the broad hypothesis that IWPs are expected to be associated with better worker and employer outcomes. The analysis indicates that when workers participate in IWPs, they develop stronger sense of empowerment, achieve more intrinsic rewards from their jobs as well as higher levels of job satisfaction. In turn, these empowered

and more satisfied workers tend to trust management more and they develop stronger commitment to the firm. These attitudinal changes are accompanied by behavioral changes. When workers participate in IWPs they tend to have more open and frequent communication with management (as well as with their coworkers). This leads them to exert more effort (to shirk less) and to engage in more peer monitoring (or horizontal monitoring). Finally, IWPs are not associated with increased stress.

While the evidence indicates that all IWPs have beneficial effects for both worker and firm outcomes, the most consistent findings that emerge from the multivariate analysis are for the favorable effects of offline teams. In addition to offline teams, we also find that other IWPs have favorable outcomes. Therefore, adoption of sets of IWPs that include offline teams and other practices such as financial incentives, will yield benefits to both employees and firms.

## **VII. Conclusions, Findings and Implications**

In this paper we undertake a variety of exercises including estimating various ordered probits models to investigate the impact of IWPs separately and in combination for a case located in Croatia. The most clear and compelling finding is that amongst the different IWPs it is membership in offline teams that most often yields favorable worker outcomes for both workers and firms. As such our findings are somewhat stronger than those contained in another recent study of offline teams in which several effects were found to be short lived (see Jones and Kato, 2007.) But in addition to offline teams, we also find that other IWPs usually have favorable outcomes. As such our findings are consistent with other econometric case studies of employee involvement including studies of online teams (e.g. Hamilton et al., 2003 and Jones *et al.*, forthcoming.) We also find that participation in sets of IWPs that include offline teams and other practices such as financial incentives, yield benefits to both employees and firms. Membership in online teams (and to a lesser extent in offline teams, in an



ESOP and a flexible compensation system) is associated with workers who perceive that they are more empowered, satisfied, committed, trusting, and communicative. In turn this results in their working harder and their being more apt to engage in peer monitoring. These conclusions consistently emerge from several exercises including our estimating various ordered probits models and when we investigate the impact of IWPs separately and when we investigate the impact of pairs and larger combinations of IWPs.

In understanding why it is that amongst the several IWPs it is membership in offline teams that is associated most often with favorable outcomes we conjecture that at ADP this reflects the key role played by managers in selecting participants. Whereas for other IWPs it is other factors, notably technology (e.g. in online teams) or tenure (being employed at ADP when the ESOP was introduced) that drives participation, for offline teams it is line- and top- management that decides who will be team members. Our findings strongly suggest that managers make very good use of their knowledge of their personnel. At the same time, in future work we would plan to examine the broader question of what determines which workers participate in particular practices in more depth and why, for the case of offline teams in particular, participation in these IWPs is not even more widespread at ADP.

One implication of our findings is to provide support for those who argue that IWPs will produce mutual gains and deliver benefits to both workers and firms. In this general sense ours is not an original finding—while the overall body of evidence is ambiguous, some do argue that increasingly there is a body of evidence that suggests that, when properly introduced, IWPs may have beneficial effects.<sup>26</sup> Thus our findings might be viewed as contributing to what might be viewed as an emerging consensus. But amongst that body of evidence our findings may carry more weight than findings derived from some other studies. They are derived from a single econometric case and thus we avoid the problems of firm heterogeneity that plague attempts in many studies to disentangle relationships between IWPs and firm or worker outcomes. Moreover, in investigating relationships between IWPs

and particular worker outcomes, notably absolute and relative work effort and peer monitoring, our approach arguably includes measures that improve over those used in most previous studies. As such our findings may also be viewed as helping to identify some of those channels that might be playing the most important roles in accounting for the ultimate improvements in business performance that many associate with IWPs.

In turn sometimes our findings differ in important particulars from findings contained in other recent studies. We find that all four IWPs are often associated with favorable worker and firm outcomes. This differs, for example from Kruse et al. (2006) who report that being a member of an ESOP was often associated with negative outcomes.<sup>27</sup> In our case, the beneficial effects of ESOPs may reflect the particular historical circumstances attending the introduction of the ESOP. But perhaps the legacy of self-management plays a role as might the co-existence of a strong labor union, as hypothesized by Goddard (2004.) Furthermore, we find that there are a number of interesting points concerning the role played by different controls. In particular, as others have found (e.g. Guptan and Eriksson, 2004) there are powerful effects of gender with women perceiving that they are less empowered and found to be less willing to engage in peer monitoring. Also different controls are found to play differing roles for different IWPs. In the main, these differences concerning controls do not appear to have figured prominently in previous work.

It is also important to emphasize that the firm and workers that we investigate in this case tend to be different from those covered in most of the existing literature. Our study is one of the first to report findings on these diverse issues for workers in a transition economy. It is reassuring to find that support for optimistic hypotheses and evidence in the received literature concerning the impact of IWPs, which were largely based on firms and workers with other characteristics, also carry over to our case. Indeed arguably our findings provide some of the clearest evidence that IWPs can deliver benefits

to all parties, even to firms that do not operate in the most advanced market economies and in economies where legacies might be expected to hinder the effectiveness of certain IWPs.

## **Appendix A: Variable definitions**

### **HR variables**

Offline team. =1 when a member of an offline team and = 0 when not in such a team.

Online team. =1 when a member of an online team and = 0 when not in such a team.

Selfmanonline. =1 when a member of a self managed online team and = 0 when not in such a Team.

Union. =1 when a member of a union and = 0 when not a member.

Incent. =1 when receiving incentive pay and = 0 when not in such a plan.

ESOP. =1 when a member of an ESOP and 0 when not in such a plan.

### **Controls**

Age. Measured in years

Gender 1= male; 0 = female.

Tenure. Years worked at the case firm.

Exper . Years in the labor market.

### **Outcome variables**

All are defined on the various tables.

(a) Most are measured using a four point scale.

(b) Unless otherwise indicated, each respondent is given four choices: 1=Strongly disagree; 2=Disagree; 3=Agree; and 4=Strongly Agree. For example, this is the case for both of the empowerment questions

(c) But for some questions a different 4 point scale is used. For example, discretionary effort is measured by responses to “How much effort do you put into your work beyond what your job requires?” where 1 = none and 4 = a lot.

(d) Relative effort (e.g. Table 4) is measured using a 10 point scale.

(e) Job satisfaction and one of the trust measures use a 5 point scale.

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**Table 1 Descriptive Statistics: Means (Standard deviations)**

Age	39.0	9.91
Experience	11.8	9.61
Tenure	11.5	9.58
% Female	49.1	0.5
% married	68.9	
% single	26.1	
Commuting time (mins.)	32.7	23.1
Hours worked (mth.)	181.8	14.48
Overtime hours (mth)	12.7	(16.9)
Vacation days (paid)	24.4	6.34
% less than 8 years ed.	1.7	
% completed grade school	7.8	
% vocational level	23.7	
% high school	45.9	
% Some college	8.2	
% Completed 4 year college	12.6	
In ESOP (%)	55	
Incentive Pay (%)	45.6	
In offline team (%)	67.2	
In online team (%)	42.8	
Of which in self managed teams (%)	58.1	
In trade union (%)	50	

<b>Table 2A Outcomes: Based on One IWP</b>	Offline team member	Non-offline team member	ESOP member	Non-ESOP member	Online team member	Non-online team member	Self-directed online team member	Non self-directed team member
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
<b>Empowerment</b> I have a lot to say about what happens on my job.	1.77***	1.37	1.62***	1.38	1.52	1.44	1.86***	1.28
"My job allows me to take part in making decisions that affect my work."	1.57***	1.18	1.42***	1.19	1.4***	1.19	1.63***	1.23
<b>Communication</b> "Management is usually open about sharing company information with employees at this company."	1.5***	1.18	1.28*	1.14	1.26	1.15	1.43***	1.15
"How often do you personally communicate about work issues with managers or supervisors in your work group or work team?" <i>Proportion of employees replying "at least weekly"</i>	71.21	69.23	74.60	66.31	73.23**	61.39	76.67	70.24
"How often do you .. communicate about work issues with managers or supervisors outside of your work group or work team within the firm?" <i>Proportion replying "at least weekly"</i>	57.25***	31.03	50.00***	32.04	43.6**	32.41	63.22***	29.51
"How often do you personally communicate about work issues with workers outside of your work group or work team within the firm?" <i>Proportion replying "at least weekly"</i>	57.25***	39.57	57.23***	37.52	45.75	40.13	64.77***	32.79

"How often do you .. communicate about work issues with technical experts outside your work group/work team, e.g engineers,and technicians, in the firm?" <i>Proportion replying "at least weekly"</i>	41.22***	20.85	38.92***	17.51	29.58	26.62	45.45***	18.70
<b>Effort</b> "How much effort do you put into your work beyond what your job requires?" 1=None, 4=A lot	3.67**	3.52	3.63**	3.50	3.6*	3.48	3.69**	3.50
Relative effort=(effort put into a typical hour or work - Effort put into a typical hour of watching TV) 0=Hardly any at all, 10=All your energy	5.40**	4.23	5.44***	4.00	4.84	4.58	5.20	4.62
Days missed in the last year	2.28	1.56	1.58	2.03	1.48	1.75	1.63	1.23
Hours worked per week	46.95***	44.72	45.67	45.43	45.93**	44.99	46.94***	45.25
"My effort at work affects my pay."	2.45***	2,86	2,68	2,76	2,71	2,75	2.55**	2,82
<b>Teamwork/Peer monitoring</b> "I help my co-workers when they need it."	2.19	2.09	2.18	2.12	2.13	2.09	2.23**	2.05
"To what extent have other employees at this company taught you job skills, short cuts, problem solving, or other ways to improve your work?" <i>1=To a great extent, 4=Not at all</i>	2.13***	2.34	2.32	2.25	2.26	2.28	2.23	2,27
"My effort at work is affected by the effort of my co-workers."	1.88***	1.56	1.76**	1.58	1.72	1.64	1.96***	1.53
"The work of my co-workers affects my pay."	1.59***	1.34	2.43***	1.33	1.42	1.47	1.59**	1.31
"If I saw a co-worker slacking off, I would say something to that worker."	1.99***	1.63	1.76	1.72	1.8**	1.64	1.84	1.77
Proportion of workers who have ever said anything to a co-worker when they saw that worker slack off (%)	25.00**	36.58	27.89*	36.84	30.33	37.34	32.96	28.70
<b>Commitment</b> "I am willing to work harder than I have to in order to help this	2.01***	1.7	1.94***	1.72	1.88**	1.7	1.97	1.81

company succeed."								
"I would take almost any job to keep working for this company."	1.28	1.29	1.24	1.31	1.22	1.28	1.28	1.27
"I would turn down another job for more pay in order to stay with this company."	1.04**	0.88	1.01	0.91	0.97	0.88	1.04	0.91
<b>Trust</b> "I am treated fairly by the firm."	1.67**	1.49	1.69***	1.44	1.56	1.52	1.64	1.52
"To what extent do you trust the management at the firm?" <i>1=To a great extent, 4=Not at all</i>	2.33***	2.70	2.50	2.60	2.56	2.63	2.34***	2.48
"In general how would you describe relations in your workplace between management and employees?" <i>1=Very good, 5=Very bad</i>	2.78***	3.21	2.98*	3.14	3.04	3.15	2.72***	3.25
<b>Job Satisfaction</b> "All in all, how satisfied would you say you are with your job?" <i>1=Very good, 5=Very bad</i>	3.9***	2.53	2.78***	2.52	2.69*	2.57	2.88***	2.58
<b>Intrinsic Rewards</b> "My job makes good use of my knowledge and skills."	1.87**	1.68	1.84**	1.67	1.85**	1.65	1.94	1.77
"What I do at work is more important to me than the money I earn."	1.09***	0.79	0.92	0.86	0.94	0.85	1.11***	0.81
<b>Job Stress</b> "My job is stressful."	3.04	1.96	2.02	1.97	1.97	1.94	2.07	1.90
Number of respondents	139	285	201	214	229	172	95	128

**Notes:** (a) Unless otherwise indicated, each respondent is given four choices: 1=Strongly agree; 2=Agree; 3=Disagree; and 4=Strongly Disagree.

(b) \*\*\*Mean differences significant at 1% level. \*\* Mean differences significant at 5% level. \*Mean differences significant at 10% level

<b>Table 2B: Combinations of IWPs and Outcomes</b>	In Offline team and ESOP member	Not Offline AND not ESOP member	In Offline Team and incentive pay	Not offline AND no incentive pay	In Online team and ESOP member	Not online AND not ESOP member	In Online Team and incentive pay	No online AND no incentive pay	In both teams and ESOP and incentive pay	In neither team, not in ESOP AND no incentive pay
	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
<b>Empowerment</b> I have a lot to say about what happens on my job.	2.11***	2.77	2.14***	2.72	2.27***	2.68	2.21***	2.63	1.96***	2.79
"My job allows me to take part in making decisions that affect my work."	2.3***	2.93	2.27***	2.85	2.43***	2.99	2.36***	2.85	2.11***	3.02
<b>Communication</b> "Management is usually open about sharing company information with employees at this company."	2.34***	2.99	2.45***	2.97	2.59***	2.92	2.59***	2.92	2.34***	3.08
"How often do you personally communicate about work issues with managers or supervisors in your work group or work team?" <i>Proportion of employees who replied "at least weekly"</i>	79.69	68.33	67.86	68.72	76.60***	58.10	67.61*	55.17	74.07	59.18
"How often do you personally communicate about work issues with managers or supervisors outside of your work group or work team within the firm?" <i>Proportion replying "at least weekly"</i>	64.06***	23.28	54.55***	24.12	55.32***	29.17	52.17***	24.30	59.25***	19.15
"How often do you personally communicate about work issues with workers outside of your work group or work team within the firm?" <i>Proportion replying "at least weekly"</i>	65.63***	30.25	55.36***	32.37	5.8.51	35.62	54.29***	33.03	55.56**	30.61
"How often do you ... communicate ... with technical experts outside of your work group or work team, such as engineers, technicians, within the firm?" <i>Proportion replying "at least weekly"</i>	55.56***	13.79	32.72**	17.24	42.55***	17.39	31.88	22.55	42.31***	12.77
<b>Effort.</b> Relative =(effort put into a typical hour or work - Effort put into a typical hour of watching TV) 0=Hardly any at all, 10=All your energy	6.25***	3.99	5.72***	4.09	5.51**	4.35	5.85***	4.15	5.88*	4.31
Days missed in the last year	3.05	2.2	2.20	1.71	1.89	2.65	1.85	2.18	2.48	3.98
Hours worked per week	47.17***	44,89	48.34***	44,41	46.38**	45,08	47.92***	44,84	48.46***	44,95
"My effort at work affects my pay."	2.44***	2.94	2.27***	2.95	2.73	2.91	2.46***	2.85	2.33***	3.17

<b>Table 2 (continued) Combinations of IWPs and Outcomes</b>	In Offline team and ESOP member	Not Offline AND not ESOP member	In Offline Team and incentive pay	Not offline AND no incentive pay	In Online team and ESOP member	Not online AND not ESOP member	In Online Team and incentive pay	No online AND no incentive pay	In both teams and ESOP and incentive pay	In neither team, not in ESOP AND no incentive pay
<b>Teamwork and Monitoring</b>	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
"To what extent have other employees at this company taught you job skills, short cuts, problem solving, or other ways to improve your work?" <i>1=To a great extent, 4=Not at all</i>	2.37	2.42	2.09***	2.43	2.43	2.41	2.11**	2.34	2.44	2.52
"The work of my co-workers affects my pay."	2.18***	2.75	2.27***	2.68	2.40**	2.69	2.40	2.59	2.11***	2.81
"If I saw a co-worker slacking off, I would say something to that worker."	2.02***	2.32	1.98***	2.35	2.13**	2.35	2.06***	2.34	1.89***	2.37
Proportion of workers who have ever said anything to a co-worker when they saw that worker slack off (%)	17.19***	38.66	20.00**	35.56	25.51**	41.33	20.29**	34.78	14.29**	39.58
<b>Commitment</b> "I am willing to work harder than I have to in order to help this company succeed."	1.77***	2.38	1.93***	2.33	1.98***	2.7	1.99***	2.37	1.77***	2.38
"I would take almost any job to keep working for this company."	2.78	2.74	2.63	2.73	2.85	2.73	2.74	2.74	2.65	2.79
"I would turn down another job for more pay in order to stay with this company."	2.91***	3.17	2.98	3.09	2.99*	3.19	3.06	3.09	2.81***	3.31
<b>Trust</b> "I am treated fairly by the company."	2.19***	2.62	2.20***	2.58	2.27***	2.56	2.33**	2.59	2.19***	2.70
"To what extent do you trust the management at this company?" <i>1=To a great extent, 4=Not at all</i>	2.22***	2.75	2.21***	2.76	2.40	2.59	2.30***	2.65	2.07***	2.68
"In general how would you describe relations in your workplace between management and employees?" <i>1=Very good, 5=Very bad</i>	2.66***	3.26	2.75***	3.35	2.91*	3.15	2.82***	3.25	2.54***	3.36
<b>Job Satisfaction</b> "...How satisfied ...say you are with your job?" <i>1=Very good, 5=Very bad</i>	1.97***	2.61	2.04***	2.57	2.15***	2.56	2.04***	2.50	1.81***	2.77
<b>Intrinsic Rewards</b> "My job makes good use of my knowledge and skills."	2.03***	2.39	2.16*	2.36	1.97***	2.39	2.15**	2.42	2.04*	2.40
"What I do at work is more important to me than the money I earn."	2.86***	3.27	2.95***	3.24	3.07**	3.31	3.03	3.16	2.85***	3.38
<b>Job Stress</b> "My job is stressful."	1.85	2.02	1.91	2.07	1.98	1.99	1.81**	2.06	1.88	2.02
Number of respondents	65	137	58	204	99	80	72	125	28	53

**Determinants of Discretionary Effort**

**Table 3**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>Age</b>	0.019** (0.009)	0.020** (0.009)	0.009 (0.012)	0.016* (0.009)	0.015* (0.009)	0.017* (0.009)	0.017* (0.009)	0.018** (0.009)	0.019** (0.009)	0.019** (0.009)	0.019** (0.010)	0.016 (0.010)
<b>Gender</b>	0.032 (0.136)	-0.116 (0.137)	0.027 (0.188)	-0.045 (0.129)	-0.059 (0.129)	-0.020 (0.126)	0.020 (0.139)	0.028 (0.136)	-0.129 (0.140)	-0.119 (0.137)	-0.089 (0.147)	-0.134 (0.150)
<b>Tenure</b>	0.011 (0.030)	0.007 (0.029)	0.010 (0.040)	0.034 (0.027)	0.018 (0.029)	0.031 (0.027)	0.010 (0.030)	0.008 (0.030)	0.008 (0.029)	0.005 (0.029)	-0.015 (0.032)	-0.018 (0.033)
<b>TenureSq.</b>	-0.0002 (0.001)	-0.0001 (0.001)	0.0001 (0.001)	-0.001 (0.001)	-0.0004 (0.001)	-0.001 (0.001)	-0.0001 (0.001)	-0.0002 (0.001)	-0.0001 (0.001)	-0.0001 (0.001)	0.001 (0.001)	0.001 (0.001)
<b>Online</b>	0.259* (0.136)						0.254 (0.137)	0.256*** (0.136)			0.036 (0.154)	0.078 (0.158)
<b>Offline</b>		0.477*** (0.152)							0.466*** (0.153)	0.473*** (0.152)	0.537*** (0.171)	0.499*** (0.175)
<b>Selfmanonline</b>			0.357* (0.192)									
<b>Incent</b>				0.277* (0.147)			0.271* (0.150)		0.183 (0.156)		0.214 (0.172)	0.216 (0.174)
<b>Union</b>					0.117 (0.137)							0.157 (0.156)
<b>ESOP</b>						0.043 (0.134)		0.070 (0.146)		0.076 (0.144)	0.011 (0.159)	0.058 (0.163)
<b>Loglike</b>	-283.0	-285.5	-149.8	-317.0	-304.5	-321.9	-278.3	-282.9	-281.8	-285.3	-260.5	-247.2
<b># obs.</b>	335	345	188	378	367	385	328	335	339	345	311	297

**Notes.**

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

2. Discretionary effort is measured by responses to “How much effort do you put into your work beyond what your job requires?” (where 1=none...and 4 = a lot.)



**Determinants of Relative Effort**

**Table 4**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	0.029*** (0.008)	0.026*** (0.008)	0.035*** (0.011)	0.027*** (0.008)	0.024*** (0.008)	0.022*** (0.008)	0.030*** (0.008)	0.025*** (0.008)	0.028*** (0.008)	0.021*** (0.008)	0.027*** (0.009)	0.025*** (0.009)
<b>Gender</b>	0.227 (0.119)	0.114 (0.119)	0.198 (0.162)	0.200* (0.116)	0.224** (0.115)	0.220** (0.112)	0.202* (0.110)	0.219** (0.120)	0.103 (0.123)	0.115 (0.119)	0.090 (0.129)	0.110 (0.131)
<b>Tenure</b>	-0.001 (0.027)	-0.007 (0.025)	-0.022 (0.035)	-0.0003 (0.025)	-0.009 (0.026)	-0.002 (0.024)	-0.007 (0.027)	-0.009 (0.027)	-0.013	-0.016 (0.025)	-0.37 (0.028)	-0.043 (0.029)
<b>TenureSq.</b>	-0.0004 (0.001)	-0.0003 (0.001)	0.0001 (0.001)	-0.001 (0.001)	-0.0002 (0.001)	-0.0005 (0.001)	-0.0003 (0.001)	-0.0002 (0.001)	-0.0002 (0.001)	-0.0002 (0.001)	0.0005 (0.001)	0.001 (0.001)
<b>Online</b>	-0.011 (0.120)						-0.022 (0.121)	-0.021 (0.120)			0.270** (0.138)	0.261* (0.140)
<b>Offline</b>		0.271** (0.127)							0.268** (0.129)	0.247* (0.127)	0.391*** (0.144)	0.345** (0.147)
<b>Selfmanonline</b>			0.051 (0.165)									
<b>Incent</b>				0.110 (0.129)			0.113 (0.136)		0.033 (0.134)		-0.002 (0.144)	-0.057 (0.146)
<b>Union</b>					0.003 (0.120)							0.001 (0.133)
<b>ESOP</b>						0.250** (0.119)		0.245** (0.128)		0.347*** (0.127)	0.326** (0.137)	0.344** (0.140)
<b>Loglike</b>	-741.3	-762.6	-403.6	-810.6	-795.1	-827.4	-722.5	-739.4	-744.0	-758.8	-684.3	-657.7
<b># obs.</b>	307	315	175	338	324	344	301	307	309	315	288	272

Notes.

1. \*\*\*, \*\*, \* statistically significant at the 1%, 5% and 10 % respectively.
2. Relative effort is measured as responses to how much effort and energy you expend on a typical hour of work less effort and energy expended on an hour watching TV, where each activity is measured on a 10 point scale and 0 = hardly any at all and 10 = all your energy.

**Determinants of Whether Have Engaged in Horizontal Monitoring**

**Table 5**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	-0.016 (0.010)	-0.009 (0.010)	-0.012 (0.014)	-0.019 (0.010)	-0.013 (0.010)	-0.013 (0.009)	-0.013 (0.010)	-0.016 (0.010)	-0.007 (0.010)	-0.008 (0.010)	-0.011 (0.011)	-0.11 (0.011)
<b>Gender</b>	0.181 (0.147)	0.154 (0.148)	0.390* (0.206)	0.210 (0.141)	0.266* (0.140)	0.230* (0.140)	0.177 (0.152)	0.182 (0.148)	0.177 (0.152)	0.153 (0.148)	-0.185 (0.159)	0.226 (0.159)
<b>Tenure</b>	-0.028 (0.033)	-0.040 (0.031)	-0.069 (0.046)	-0.056* (0.030)	-0.048 (0.031)	-0.050* (0.030)	-0.349 (0.033)	-0.029 (0.033)	-0.050	-0.039 (0.031)	-0.041 (0.035)	-0.048 (0.036)
<b>TenureSq.</b>	0.001 (0.001)	0.001 (0.001)	0.003 (0.002)	0.002 (0.001)	0.001 (0.001)	0.002 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)	0.001 (0.001)
<b>Online</b>	0.194 (0.148)						0.187 (0.151)	0.195 (0.149)			0.148 (0.170)	0.164 (0.174)
<b>Offline</b>		0.324 (0.161)							0.295* (0.163)	0.339** (0.161)	0.201 (0.182)	0.200 (0.185)
<b>Selfmanonline</b>			0.123 (0.208)									
<b>Incent</b>				0.266* (0.159)			0.218 (0.173)		0.168 (0.167)		0.207 (0.183)	0.222 (0.185)
<b>Union</b>					-0.149 (0.149)							-0.113 (0.168)
<b>ESOP</b>						0.015 (0.144)		0.026 (0.158)		-0.043 (0.155)	0.036 (0.171)	0.622 (0.175)
<b>Loglike</b>	-202.9	-208.3	-109.4	-227.7	-224.7	-236.0	-195.3	-202.9	-202.3	-208.3	-184.1	-176.2
<b># obs.</b>	324	337	182	366	356	373	320	324	331	337	302	289

**Notes.**

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

2. Whether one has engaged in horizontal monitoring is determined by responses to “Have you ever said anything to a co-worker when you saw that worker slack off?” where 1 =yes and 0 = No.

**Determinants of Willingness to Horizontally Monitor**

**Table 6**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	-0.025*** (0.008)	-0.020*** (0.008)	-0.026*** (0.011)	-0.019*** (0.008)	-0.024*** (0.008)	-0.021*** (0.008)	-0.024*** (0.008)	-0.257*** (0.008)	-0.019*** (0.008)	-0.21*** (0.008)	-0.025*** (0.009)	-0.025*** (0.009)
<b>Gender</b>	0.380*** (0.125)	0.315*** (0.124)	0.457*** (0.169)	0.306*** (0.119)	0.345*** (0.118)	0.340*** (0.115)	0.359*** (0.129)	0.384*** (0.125)	0.311*** (0.127)	0.317*** (0.124)	0.354*** (0.135)	0.354** (0.135)
<b>Tenure</b>	0.005 (0.027)	0.003 (0.026)	0.017 (0.035)	-0.004 (0.025)	0.003 (0.025)	-0.006 (0.025)	0.005 (0.027)	0.003 (0.027)	0.003 (0.026)	0.000 (0.026)	0.008 (0.029)	0.008 (0.029)
<b>TenureSq.</b>	0.0001 (0.0008)	0.0002 (0.001)	-0.0002 (0.001)	0.0003 (0.0008)	0.0001 (0.0008)	0.0005 (0.0008)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	0.000 (0.001)	-0.00005 (0.0009)	-0.00009 (0.0009)
<b>Online</b>	0.341*** (0.126)						0.337*** (0.127)	0.345*** (0.126)			0.255* (0.144)	0.240* (0.148)
<b>Offline</b>		0.465*** (0.132)							0.455*** (0.134)	0.477*** (0.133)	0.333** (0.152)	0.342** (0.155)
<b>Selfmanonline</b>			0.074 (0.167)									
<b>Incent</b>				0.128 (0.132)			0.088 (0.144)		0.045 (0.138)		0.067 (0.152)	0.100 (0.155)
<b>Union</b>					-0.156 (0.124)							-0.093 (0.141)
<b>ESOP</b>						0.123 (0.120)		0.067 (0.133)		0.105 (0.129)	0.058 (0.143)	0.073 (0.146)
<b>Loglike</b>	-336.0	-352.1	-203.0	-390.0	-372.3	-395.4	-330.4	-335.8	-347.8	-351.8	-310.2	-294.3
<b># obs.</b>	346	360	196	391	377	398	339	346	354	360	324	307

Notes.

1. \*\*\*, \*\*, \* statistically significant at the 1%, 5% and 10% respectively.
2. Willingness to horizontally monitor is measured by responses to “If I saw a co-worker slacking off, I would say something to that worker” where 1 = strongly disagree ...and 4 = strongly agree.

**Determinants of Empowerment**

**Table 7**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>Age</b>	-0.003 (0.008)	-0.006 (0.008)	-0.009 (0.011)	-0.001 (0.008)	-0.004 (0.008)	0.002 (0.008)	-0.001 (0.008)	0.003 (0.008)	-0.005 (0.008)	-0.001 (0.008)	0.0002 (0.008)	-0.001 (0.010)
<b>Gender</b>	0.524*** (0.123)	0.429*** (0.122)	0.456*** (0.167)	0.427*** (0.117)	0.441*** (0.115)	0.448*** (0.113)	0.521*** (0.127)	0.522*** (0.123)	0.419*** (0.125)	0.443*** (0.122)	0.503*** (0.133)	0.476*** (0.135)
<b>Tenure</b>	-0.008 (0.026)	0.010 (0.025)	0.001 (0.035)	-0.006 (0.024)	0.008 (0.025)	0.011 (0.024)	-0.014 (0.027)	0.001 (0.027)	0.003 (0.025)	0.023 (0.025)	0.022 (0.028)	0.026 (0.029)
<b>TenureSq.</b>	0.0003 (0.001)	-0.0002 (0.001)	0.0003 (0.001)	0.0001 (0.001)	-0.0008 (0.001)	-0.0002 (0.001)	0.0004 (0.001)	-0.0002 (0.001)	0.003 (0.025)	-0.0005 (0.001)	-0.0005 (0.001)	-0.001 (0.001)
<b>Online</b>	0.349*** (0.122)						0.321*** (0.124)	0.329*** (0.123)			0.152 (0.142)	0.127 (0.145)
<b>Offline</b>		0.497*** (0.130)							0.459*** (0.132)	0.461*** (0.131)	0.369*** (0.149)	0.404*** (0.153)
<b>Selfmanonline</b>			0.416*** (0.167)									
<b>Incent</b>				0.308** (0.130)			0.279** (0.141)		0.249* (0.137)		0.130 (0.150)	0.162 (0.152)
<b>Union</b>					0.183 (0.122)							0.118 (0.139)
<b>ESOP</b>						0.403*** (0.119)		0.524*** (0.132)		0.464*** (0.128)	0.510*** (0.142)	0.468*** (0.145)
<b>Loglike</b>	-212.5	-381.5	-212.5	-417.3	-405.2	-424.3	-359.4	-363.2	-371.6	-375.0	-332.7	-317.4
<b># obs.</b>	346	358	194	392	378	399	339	346	352	358	322	305

Notes.

Notes.

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

2 Empowerment is measured by responses to “My job allows me to take part in making decisions that affect my work” where 1= strongly disagree...and 4 = strongly agree.

**Determinants of Employee Involvement**

**Table 8**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	-0.014* (0.008)	-0.016** (0.008)	-0.018* (0.011)	-0.012 (0.008)	-0.016** (0.008)	-0.011 (0.008)	-0.012 (0.008)	-0.011 (0.008)	-0.015** (0.008)	-0.013* (0.008)	-0.012 (0.008)	-0.014 (0.009)
<b>Gender</b>	0.769*** (0.125)	0.709*** (0.124)	0.603*** (0.168)	0.660*** (0.118)	0.682*** (0.117)	0.715*** (0.114)	0.722*** (0.128)	0.762 (0.125)	0.676*** (0.126)	0.716*** (0.124)	0.683*** (0.134)	0.631*** (0.136)
<b>Tenure</b>	0.017 (0.026)	0.030 (0.025)	0.001 (0.035)	0.013 (0.024)	0.031 (0.025)	0.027 (0.024)	0.013 (0.026)	0.028 (0.027)	0.022 (0.025)	0.038 (0.025)	0.037 (0.028)	0.044 (0.029)
<b>TenureSq.</b>	-0.0004 (0.001)	-0.001 (0.001)	0.0005 (0.001)	-0.0004 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.0004 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	0.037 (0.028)	-0.001 (0.001)
<b>Online</b>	0.224* (0.121)						0.199* (0.113)	0.210 (0.121)			0.010 (0.140)	-0.013 (0.143)
<b>Offline</b>		0.490***							0.438*** (0.131)	0.460*** (0.130)	0.432*** (0.149)	0.474*** (0.152)
<b>Selfmanonline</b>			0.623*** (0.169)									
<b>Incent</b>				0.391*** (0.129)			0.361*** (0.140)		0.335** (0.136)		0.252** (0.149)	0.270** (0.151)
<b>Union</b>					0.103 (0.121)							0.118 (0.137)
<b>ESOP</b>						0.251** (0.117)		0.296 (0.129)		0.293** (0.126)	0.250* (0.139)	0.213 (0.142)
<b>Loglike</b>	-381.0	-388.4	-214.2	-428.9	-415.8	-437.3	-371.6	-378.4	-380.1	-385.7	-345.2	-329.4
<b># obs.</b>	349	363	196	397	383	404	342	349	357	363	325	308

Notes.

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

2 Employee involvement is measured by responses to “I have a lot to say about what happens on my job.” where 1= strongly disagree...and 4 = strongly agree.

**Determinants of Job Satisfaction**

**Table 9**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	-0.010 (0.008)	-0.006 (0.008)	-0.010 (0.011)	-0.004 (0.008)	-0.004 (0.008)	-0.0001 (0.008)	-0.007 (0.009)	-0.002 (0.009)	-0.005 (0.008)	0.002 (0.008)	0.002 (0.009)	0.002 (0.009)
<b>Gender</b>	0.594*** (0.129)	0.492*** (0.128)	0.628*** (0.177)	0.455*** (0.121)	0.560*** (0.120)	0.571*** (0.118)	0.493*** (0.134)	0.601*** (0.131)	0.407*** (0.132)	0.532*** (0.130)	0.477*** (0.144)	0.462*** (0.147)
<b>Tenure</b>	0.057*** (0.027)	0.064*** (0.026)	0.062* (0.037)	0.492** (0.025)	0.064** (0.025)	0.712*** (0.025)	0.058** (0.028)	0.086*** (0.028)	0.059** (0.027)	0.089*** (0.027)	0.105*** (0.030)	0.115*** (0.031)
<b>TenureSq.</b>	-0.001 (0.001)	-0.001* (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001* (0.001)	-0.001** (0.001)	-0.001* (0.001)	-0.002** (0.001)	-0.001** (0.001)	-0.002** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)
<b>Online</b>	0.255** (0.127)						0.220* (0.129)	0.229* (0.128)			0.014 (0.150)	-0.018 (0.153)
<b>Offline</b>		0.576*** (0.139)							0.514*** (0.142)	0.526*** (0.141)	0.545*** (0.165)	0.601*** (0.168)
<b>Selfmanonline</b>			0.367** (0.176)									
<b>Incent</b>				0.660*** (0.140)			0.630*** (0.154)		0.575*** (0.149)		0.428** (0.167)	0.427** (0.169)
<b>Union</b>					0.324*** (0.125)							0.328** (0.148)
<b>ESOP</b>						0.546*** (0.124)		0.701*** (0.140)		0.770*** (0.138)	0.801*** (0.156)	0.797*** (0.159)
<b>Loglike</b>	-334.1	-343.4	-188.6	-380.9	-376.0	-389.5	-318.7	-321.3	-330.0	-327.5	-278.8	-263.1
<b># obs.</b>	345	359	193	393	379	400	338	345	353	359	321	304

Notes.

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

2     Job satisfaction is measure by responses to “All in all, how satisfied would you say you are with your job?” where 1= very dissatisfied...and 5= very satisfied.

**Determinants of Communications**

**Table 10**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	-0.010 (0.008)	-0.005 (0.008)	-0.003 (0.011)	-0.005 (0.008)	-0.007 (0.008)	-0.005 (0.008)	-0.007 (0.008)	-0.008 (0.008)	-0.003 (0.008)	-0.004 (0.008)	-0.003 (0.009)	-0.004 (0.009)
<b>Gender</b>	0.581*** (0.128)	0.400*** (0.129)	0.387** (0.167)	0.502*** (0.125)	0.541*** (0.125)	0.543*** (0.122)	0.549*** (0.132)	0.579*** (0.128)	0.386*** (0.132)	0.400*** (0.129)	0.435 (0.138)	0.434 (0.140)
<b>Tenure</b>	-0.012 (0.28)	0.012 (0.028)	-0.006 (0.035)	-0.002 (0.027)	0.006 (0.028)	-0.001 (0.027)	-0.008 (0.028)	-0.009 (0.028)	0.014 (0.028)	0.014 (0.028)	0.006 (0.029)	0.016 (0.030)
<b>TenureSq.</b>	0.0005 (0.001)	-0.0005 (0.001)	-0.0001 (0.001)	-0.00003 (0.001)	-0.0001 (0.001)	0.0001 (0.001)	0.0002 (0.001)	0.0004 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.0003 (0.001)	-0.001 (0.001)
<b>Online</b>	0.388*** (0.127)						0.384*** (0.128)	0.379*** (0.127)			0.206 (0.145)	0.161 (0.149)
<b>Offline</b>		0.656*** (0.133)							0.646*** (0.135)	0.642*** (0.0134)	0.533 (0.150)	0.551 (0.154)
<b>Selfmanonline</b>			0.542*** (0.170)									
<b>Incent</b>				0.326** (0.136)			0.257* (0.143)		0.154 (0.142)		0.126 (0.151)	0.101 (0.154)
<b>Union</b>					0.153 (0.131)							0.177 (0.143)
<b>ESOP</b>						0.156 (0.127)		0.108 (0.135)		0.117 (0.135)	0.035 (0.145)	0.003 (0.148)
<b>Constant</b>												
<b>Loglike</b>	-449.8	-451.1	-268.2	-479.1	-453.4	-485.7	-443.4	-449.5	-446.6	-450.7	-422.7	-393.7
<b># obs.</b>	315	317	188	336	320	339	312	315	315	317	298	281

Notes.

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

2 Communications are measured by responses to “How often do you personally communicate about work issues with managers or supervisors outside of your work group or work team within the firm” where 1 = never, 2 = rarely, 3 = monthly, 4 = weekly and 5 = daily.

**Determinants of Commitment**

**Table 11**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	-0.021** (0.008)	-0.022*** (0.008)	-0.023** (0.011)	-0.019** (0.008)	-0.020** (0.008)	-0.017** (0.008)	-0.019** (0.008)	-0.016* (0.008)	-0.021*** (0.008)	-0.018** (0.008)	-0.015** (0.009)	-0.014 (0.009)
<b>Gender</b>	0.290** (0.124)	0.195 (0.123)	0.301* (0.169)	0.221* (0.118)	0.259** (0.116)	0.266** (0.114)	0.243* (0.128)	0.278** (0.124)	0.174 (0.126)	0.199* (0.123)	0.186 (0.135)	0.154 (0.138)
<b>Tenure</b>	0.058** (0.028)	0.058** (0.026)	0.050 (0.037)	0.031 (0.025)	0.046* (0.026)	0.045* (0.025)	0.054* (0.028)	0.075*** (0.028)	0.052** (0.026)	0.069*** (0.026)	0.094*** (0.030)	0.097*** (0.030)
<b>TenureSq.</b>	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.0004 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.002* (0.001)	-0.001 (0.001)	-0.001* (0.001)	-0.002** (0.001)	-0.002** (0.001)
<b>Online</b>	0.321*** (0.123)						0.313** (0.127)	0.303** (0.126)			0.109 (0.144)	-0.127 (0.147)
<b>Offline</b>		0.522*** (0.134)							0.499*** (0.136)	0.485*** (0.135)	0.512*** (0.155)	0.502*** (0.158)
<b>Selfmanonline</b>			0.174 (0.172)									
<b>Incent</b>				0.267** (0.132)			0.285* (0.144)		0.164 (0.139)		0.096 (0.153)	0.124 (0.155)
<b>Union</b>					-0.046 (0.123)							0.004 (0.142)
<b>ESOP</b>						0.280** (0.120)		0.433*** (0.133)		0.395*** (0.130)	0.495*** (0.145)	0.481*** (0.148)
<b>Loglike</b>	-353.0	-368.4	-209.7	-403.5	-391.8	-410.8	-342.9	-347.7	-360.9	-363.7	-315.6	-299.7
<b># obs.</b>	341	354	192	386	372	393	334	341	348	354	317	300

Notes.

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

2 Commitment is measured by responses to “I am willing to work harder than I have to in order to help this company to succeed” where 1= strongly disagree...and 4 = strongly agree.



**Determinants of Teamwork**

**Table 12**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	0.009 (0.008)	0.013* (0.008)	0.005 (0.010)	0.014* (0.008)	0.014* (0.008)	0.015* (0.008)	0.010 (0.008)	0.011 (0.008)	0.013* (0.008)	0.015* (0.008)	0.014* (0.008)	0.016* (0.009)
<b>Gender</b>	0.59 (0.120)	0.057 (0.120)	0.113 (0.163)	0.078 (0.115)	0.069 (0.114)	0.147 (0.112)	-0.015 (0.124)	0.053 (0.121)	0.008 (0.122)	0.059 (0.120)	-0.082 (0.130)	-0.163 (0.133)
<b>Tenure</b>	0.77*** (0.026)	0.085*** (0.025)	0.085** (0.035)	0.080*** (0.025)	0.080*** (0.025)	0.071*** (0.024)	0.078*** (0.026)	0.084*** (0.027)	0.083*** (0.025)	0.091*** (0.025)	0.101*** (0.028)	0.114*** (0.029)
<b>TenureSq.</b>	-0.002** (0.001)	-0.002*** (0.001)	-0.002* (0.001)	-0.002** (0.001)	-0.002*** (0.001)	-0.002** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.002*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)	-0.003*** (0.001)
<b>Online</b>	0.006 (0.121)						-0.014 (0.123)	-0.004 (0.121)			-0.231* (0.140)	-0.199 (0.143)
<b>Offline</b>		0.345*** (0.128)							0.328** (0.130)	0.322** (0.129)	0.440*** (0.148)	0.424*** (0.151)
<b>Selfmanonline</b>			0.120 (0.163)									
<b>Incent</b>				0.257** (0.130)			0.258** (0.140)		0.172 (0.136)		0.142 (0.148)	0.151 (0.151)
<b>Union</b>					0.113 (0.121)							0.175 (0.137)
<b>ESOP</b>						0.148 (0.118)		0.185 (0.129)		0.220* (0.127)	0.242* (0.140)	0.153 (0.143)
<b>Loglike</b>	-385.6	-400.1	-226.9	-437.2	-418.3	-445.1	-377.0	-384.6	-393.7	-398.6	-354.2	-333.0
<b># obs.</b>	349	361	197	393	379	400	342	349	355	361	325	308

Notes.  
 1 \*\*\*, \*\*, \* statistically significant at the 1%, 5% and 10 % respectively.  
 2 Team work t is measured by responses to “To what extent have other employees at this company taught you job skills, short cuts, problem solving, or other ways to improve your work?” where 1= not at all ...and 4 = to a great extent.

**Determinants of Intrinsic Rewards (Knowledge and Skills)**

**Table 13**

	1	2	3	4	5	6	7	8	9	10	11	12
<b>Age</b>	-0.016** (0.008)	-0.016** (0.008)	-0.009 (0.016)	-0.010 (0.008)	-0.011 (0.008)	-0.011 (0.008)	-0.014* (0.008)	-0.013* (0.008)	-0.015* (0.008)	-0.014* (0.008)	-0.015* (0.008)	-0.012 (0.009)
<b>Gender</b>	0.212* (0.121)	0.154 (0.120)	0.127 (0.166)	0.227* (0.115)	0.227* (0.114)	0.238* (0.111)	0.209* (0.125)	0.203* (0.121)	0.150 (0.123)	0.154 (0.120)	0.153 (0.131)	0.118 (0.134)
<b>Tenure</b>	0.010 (0.026)	0.038 (0.025)	0.045 (0.036)	0.015 (0.024)	0.027 (0.025)	0.024 (0.024)	0.004 (0.026)	0.018 (0.027)	0.033 (0.025)	0.043* (0.025)	0.024 (0.028)	0.029 (0.028)
<b>TenureSq.</b>	-0.0003 (0.001)	-0.001 (0.001)	-0.002* (0.001)	-0.0005 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.0001 (0.001)	-0.0005 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
<b>Online</b>	0.355*** (0.0122)						0.366*** (0.124)	0.344*** (0.123)			0.283** (0.140)	0.289** (0.143)
<b>Offline</b>		0.314** (0.129)							0.315** (0.131)	0.295** (0.130)	0.173 (0.148)	0.186 (0.151)
<b>Selfmanonline</b>			0.163 (0.168)									
<b>Incent</b>				0.114 (0.129)			0.061 (0.140)		0.040 (0.136)		-0.006 (0.149)	0.018 (0.151)
<b>Union</b>					0.157 (0.121)							0.164 (0.137)
<b>ESOP</b>						0.141 (0.117)		0.226* (0.130)		0.171 (0.126)	0.218 (0.139)	0.214 (0.142)
<b>Loglike</b>	-383.2	-406.9	-220.6	-445.5	-432.1	-451.5	-376.5	-381.6	-401.1	-405.9	-356.4	-340.7
<b># obs.</b>	347	360	195	393	379	400	340	347	354	360	323	306

Notes.

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

2 Intrinsic rewards is measured by responses to “My job makes good use of my knowledge and skills” where 1= strongly disagree...and 4 = strongly agree.

**Determinants of Importance of Work to Me (Relative to Money)**

**Table 14**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>Age</b>	-0.002 (0.008)	-0.004 (0.008)	0.002 (0.011)	-0.002 (0.008)	-0.009 (0.008)	-0.001 (0.008)	-0.001 (0.008)	0.0004 (0.008)	-0.003 (0.008)	-0.002 (0.008)	-0.001 (0.009)	-0.007 (0.009)
<b>Gender</b>	0.274** (0.125)	0.244* (0.125)	0.147 (0.170)	0.301** (0.120)	0.328** (0.119)	0.290** (0.116)	0.291* (0.129)	0.266* (0.125)	0.259* (0.128)	0.245* (0.125)	0.249* (0.135)	0.256* (0.138)
<b>Tenure</b>	0.019 (0.027)	0.025 (0.026)	0.047 (0.036)	0.018 (0.025)	0.023 (0.026)	0.031 (0.025)	0.010 (0.027)	0.027 (0.027)	0.016 0.026	0.029 (0.026)	0.021 (0.028)	0.015 (0.029)
<b>TenureSq.</b>	-0.001 (0.001)	-0.001 (0.001)	-0.002 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
<b>Online</b>	0.143 (0.125)						0.142 (0.127)	0.132 (0.126)			0.050 (0.145)	-0.021 (0.149)
<b>Offline</b>		0.424*** (0.133)							0.419*** (0.135)	0.407*** (0.134)	0.399*** (0.153)	0.492*** (0.157)
<b>Selfmanonline</b>			0.372** (0.171)									
<b>Incent</b>				0.046 (0.133)			0.008 (0.144)		0.018 (0.139)		-0.066 (0.152)	-0.019 (0.155)
<b>Union</b>					-0.010 (0.126)							-0.045 (0.142)
<b>ESOP</b>						0.164 (0.123)		0.213 (0.134)		0.185 (0.131)	0.171 (0.143)	0.188 (0.147)
<b>Loglike</b>	-337.9	-342.5	-191.6	-373.6	-358.8	-379.8	-330.8	-336.6	-335.9	-341.5	-313.1	-295.5
<b># obs.</b>	348	363	196	395	381	402	341	348	357	363	325	308

Notes.

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

2 Intrinsic rewards t is measured by responses to “What I do at work is more important to me than the money I earn” where 1= strongly disagree...and 4 = strongly agree.

**Determinants of Trust**

**Table 15**

	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>	<b>7</b>	<b>8</b>	<b>9</b>	<b>10</b>	<b>11</b>	<b>12</b>
<b>Age</b>	-0.014* (0.008)	-0.014* (0.008)	-0.023** (0.011)	-0.014* (0.008)	-0.016* (0.008)	-0.010 (0.008)	-0.014* (0.008)	-0.008 (0.008)	-0.014* (0.008)	-0.009 (0.008)	-0.009 (0.008)	-0.012 (0.009)
<b>Gender</b>	0.274** (0.122)	0.205* (0.121)	0.297* (0.167)	0.183 (0.116)	0.262** (0.115)	0.263** (0.113)	0.194 (0.125)	0.260** (0.122)	0.213 (0.122)	0.213* (0.122)	0.168 (0.132)	0.151 (0.134)
<b>Tenure</b>	0.034 (0.026)	0.046* (0.026)	0.043 (0.035)	0.034 (0.025)	0.040 (0.025)	0.045* (0.025)	0.036 (0.026)	0.054** (0.027)	0.047* (0.026)	0.062** (0.026)	0.070** (0.028)	0.070** (0.029)
<b>TenureSq.</b>	-0.0005 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)	-0.001* (0.001)	-0.001* (0.001)
<b>Online</b>	0.040 (0.121)						0.020 (0.123)	0.013 (0.122)			-0.091 (0.141)	-0.113 (0.144)
<b>Offline</b>		0.228* (0.129)							0.194 (0.131)	0.175 (0.130)	0.156 (0.149)	0.168 (0.152)
<b>Selfmanonline</b>			0.132 (0.166)									
<b>Incent</b>				0.403*** (0.133)			0.366*** (0.142)		0.322** (0.140)		0.206 (0.151)	0.203 (0.153)
<b>Union</b>					0.034 (0.122)							-0.082 (0.138)
<b>ESOP</b>						0.401*** (0.120)		0.526*** (0.132)		0.509*** (0.130)	0.580*** (0.143)	0.578*** (0.145)
<b>Loglike</b>	-381.0	-388.8	-214.8	-422.3	-413.0	-427.2	-371.6	-373.0	-380.9	-381.0	-343.8	-329.5
<b># obs.</b>	348	360	196	393	380	400	341	348	354	360	324	307

Notes.

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

2 Trust is measured by responses to “I am treated fairly by the company” where 1= strongly disagree...and 4 = strongly agree.



## ENDNOTES

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<sup>1</sup> For example Jones and Klinedinst, 2005 report the diffusion of such practices in Bulgaria

<sup>2</sup> Most evidence that uses country surveys, such as Kahaunen and Palmi (2008) for Finland, understandably has tended to concentrate on worker rather than firm outcomes. This is also true of most case studies that examine outcomes collected from employee surveys (e.g. Batt, 2003). By contrast our survey is unusual insofar as it enables us to investigate possible links between various work practices and employee outcomes (including commitment, employee involvement and job satisfaction) *and* outcomes of most interest to firms, such as peer monitoring and the supply of effort. There are other studies, including some of those produced by the shared capitalism project (e.g. Freeman et al., 2006) that take a similar tack though they tend not to go as deep within the black box as does this paper. Also there is an important and often neglected body of work that has used employee surveys to look at firm and worker outcomes in firms with very different organizational structures, notably worker owned firms. Studies include work by Rhodes, Long, Greenberg, Ros for US firms and Bradley and Gelb for firms elsewhere.

<sup>3</sup> Note that the bulk of evidence on economic outcomes has been derived from firm-level, cross industry surveys. Such studies necessarily have shortcomings such as the inability to control for variation in IWPs within large multi-plant firms. Equally most surveys of this evidence (e.g. Doucouliagos, 1995) find that normally most innovative IWPs such as profit sharing and employee ownership are beneficial to firm performance. However not all assessments are so optimistic --see for example, Ben-Ner, Jones and Han, 1996. In part assessments differ because of the varying reliability of findings. In turn this reflects the different types of econometric methods used, as well as the nature of the underlying data.

<sup>4</sup> There is a neglected history of economists trying to measure some of these variables, including Stafford (1980). Ros (2001, 2003) is a notable recent exception in attempting to provide evidence on economic hypotheses such as effort supply by using data derived from worker surveys though, unfortunately, his findings are restricted in part because of small sample sizes. More recent work of this kind includes papers emerging from the shared capitalism project (e.g. Freeman et al 2004 and Kruse et al., 2004.)

<sup>5</sup> For a discussion of this approach and related concepts including insider econometrics see Bartel et al. (2004) and Jones et al. (200

<sup>6</sup> As such we continue procedures that were developed in earlier work, beginning in 2000 for US firms. See for example Jones et al., 2003.

<sup>7</sup> Heywood and Jirjahn (2002) also make a similar distinction, though using slightly different terminology.

<sup>8</sup> For other related literature, see the insightful discussion in Dow (2003, ch. 8.5).

<sup>9</sup>Two recent econometric case studies of the impact of teams are Hamilton et al. (2003) who look at online teams while Jones and Kato (2007) investigate the impact of offline teams. Both find favorable firm outcomes.

<sup>10</sup> For company level evidence, see, e.g. Wadwhani and Wall (1990); Kruse (1993); Kumbhakar

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and Dunbar (1993); Jones and Kato (1995). See also the econometric case study evidence by Knez and Simester (2001).

<sup>11</sup> For example Jones and Kato (2007) document that initially there were positive productivity effects at the case they study but that these benefits were dissipated, arguably because of the failure to introduce a balance set of IWPs.

<sup>12</sup> For additional information on labour market institutions and industrial relations in Croatia see Greguriek (2001) and Nusinovic and Vidovic (1999).

<sup>13</sup> Some plants are located in metropolitan areas (including one on Zagreb.) While we do not focus on those plants in this study we note that they have faced a somewhat different situation from the plants we study. Two of them have aggressively entered emerging product markets such as wireless and broadband. Employment at these plants grew at an extraordinarily rapid clip between 1994 and 1999, and both had strong profit positions. However, some executives at these divisions expressed uncertainty about whether these new markets would be sustainable over the long haul – a view that unfortunately proved to be far-sighted.

<sup>14</sup> While studies of IWPs are scarce in Croatia, Poloski et al. find that IWPs are less common in Croatia than in other Western countries.

<sup>15</sup> The questionnaire builds on core questions that have been used in previous work with which one of the authors has been associated, e.g. Jones et al., 2003. Thus the survey is “customized” to reflect specific features of the HR set-up at a specific firm. Most questions use Likert type scales and solicit employee responses in worker outcome areas such as job satisfaction and trust and on issues that are more likely to be regarded as relating to firm outcomes such as willingness to engage in peer monitoring and the provision of discretionary effort.

<sup>16</sup> Of course this is not an exhaustive list of combinations or categories. We could, for example, make comparisons with those in intermediate categories—such as participating in only one IWP.

<sup>17</sup> While many of these dimensions are frequently examined in the literature (e.g. Capelli and Neumark, 2001; Batt, 2004; Freeman et al, 2000) unsurprisingly the particular language used in questions varies. As already noted the specific wording in our questionnaire builds on core questions that have been used in previous work with which one of the authors has been associated, e.g. Jones et al., 2003. Also the questionnaires used in those earlier studies include some novel adaptations of questions in some areas, including the provision of effort.

<sup>18</sup> In unreported regressions we also include controls for several categories of education and wages (which is also measured as a categorical variable). By and large findings are not sensitive to these modifications.

<sup>19</sup> This variable is normalized with reference to effort spent watching TV.

<sup>20</sup> On the basis of Wald tests, the preferred specifications are those reported in columns 11 and 12.

<sup>21</sup> Again Wald tests lead us to select the preferred specifications as those reported in columns 11 and 12.

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<sup>22</sup> It is important to remember that for these and other results, since different numbers of observations are usually involved in the different specifications reported in the tables, that findings from different estimates are not usually directly comparable.

<sup>23</sup> Given the variable definitions, an alternative interpretation provided by a colleague who is fan of the NY Yankees and the NY Giants is that men may work harder than women when watching TV.

<sup>24</sup> In Table 5 Wald tests lead us to select the specifications reported in columns 9 and 10 as preferred; in Table 6 the preferred specifications are those in columns 11 and 12.

<sup>25</sup> These are the preferred specifications.

<sup>26</sup> For the U.S. studies include those by Appelbaum et al. (2000), Black and Lynch (1997), Freeman et al. (2000), Helper (1998), Ichniowski et al. (1997), Levine and Tyson (1990), MacDuffie (1995), and Neumark and Cappelli (1999). For the interesting case of Japan see Jones and Kato (1995) and Kato (2000).

<sup>26</sup> This includes previous work by one of the authors where, together with Kato, some exercises similar to those reported in this paper and for comparable outcomes are reported for a group of cases in central New York (see Jones et al, 2003.) In addition see again for Finland Kalmi and Kauhanen (2008) and papers emerging from the Shared Capitalism project, such as Freeman et al., 2003, 2004 and 2006).

<sup>27</sup> Similar findings concerning the ambiguous impact of ESOPs have been found in many other studies—see, for example, Logue and Yates (2001.)



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