

Working paper

# Incentives and Productivity

Work Groups vs.  
Production Lines

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**Report on Pilot Project**

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## Introduction

The fan sector is an important source of employment in the region in central Punjab, Pakistan. Around 40,000 workers produce an estimated 10 million fans annually (Munir and Khan, 2011). Moreover, the fan sector is representative of other light engineering sectors in Pakistan. The vast majority of the 400 to 500 firms are clustered in the vicinity of Gujrat and Gujranwalla; only six firms employ more than 250 workers and qualify as large scale. Exports of fans from Pakistan have increased rapidly in the last ten years, reaching nearly \$40 million in 2012. The growth in exports is partially in response to sluggish growth in domestic demand. The largest markets are in the Middle East, Bangladesh, and Africa.

Pakistani fans are particularly well suited to the tropical climates of its major export destinations, and their quality is generally regarded as superior to competitors.<sup>1</sup> Nonetheless, competition from Chinese firms has become a threat to the Pakistani fan sector, and the largest firms are now focused on increasing productivity in order to remain competitive.

Pakistani producers face challenges matching labour supply and demand. Production is seasonal, with a high season of about six months where production reaches capacity accounting for 80 percent of production, and a low season (Kamal and Khan, 2011)<sup>2</sup>. Workers are drawn primarily from Gujrat and its surrounding areas, and absenteeism is high. Production is organized by batch rather than assembly line partly because of the high rates of absenteeism. In batch production, daily production targets can be met by extending the working day when workers are absent. In assembly line production, absenteeism is more problematic because each worker has a specific task on the line, and so missing workers must be replaced.

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<sup>1</sup> It has been reported anecdotally that some Chinese fans for sale in Bangladesh were marked "Made in Pakistan".

<sup>2</sup> Many small units shut down in the low season, whereas the large firms continue to produce at less than capacity.

In this pilot project, we worked with one of the largest producers of fans on the role of incentives in worker attendance. The factory owners noted that production in China is most commonly organized in assembly lines, and believed that assembly lines would result in higher productivity. The assembly lines result in lower levels of in-process inventories. With less in-process inventory, there is less damage to components and less need for re-working. However, the factory had made a previous attempt to shift the motor winder operation from batch to line production. The attempt met with failure, mainly due to lack of buy-in by the ustaad<sup>3</sup> and problems with irregular attendance and frequent breaks taken by workers. As a result, the factory reverted to batch production, with separate teams of workers building different components in individual workshops. The factory managers viewed a reduction in absenteeism as an important first step in a second attempt to transition from batch to line production.

Management agreed to pilot various incentive schemes to attempt to change some of these worker habits. We test whether short-term financial incentives decrease absenteeism. We test both individual and group incentives in a sample of 8 production teams. Management also agreed to transition several teams from batch to assembly lines, one team at a time in several of the production processes. We use a combination of survey, observational, and administrative data to gain an understanding of the nature of worker responses to these shifts in production. A worker-level survey was conducted to gather information on their backgrounds and attitudes (especially team orientation, cooperation, and flexibility). The survey data will help us to understand both intra-team interactions and worker-level characteristics correlated with successful transitions between production techniques.

### Organization of Production

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<sup>3</sup> The ustaad is the foreman for the work group, but with somewhat more autonomy than foremen typically have in European factories. Ustaads make hiring and firing decisions within their group, and also decide how the total compensation for the team is divided among the workers. Hence, they are closer to independent labour contractors than a typical European foreman is.

The factory produces a variety of fans, including ceiling, pedestal, bracket, and exhaust fans. For all of the fan types, production is broken down into several stages. Each of these stages takes place in individual workshops by teams of workers, under the supervision of a leader or “ustaad”. Depending on the complexity of that stage and the level of production, there may be several teams working on the same stage of production. These teams may work side-by-side or in separate rooms, depending on space limitations.<sup>4</sup>

Output is measured at the team level, and the team is paid on a piece rate per unit. Each member of the team receives a share of the team’s production called “nafri”. The worker’s individual nafri is determined primarily by the ustaad (with occasional input from management) and is based mainly on the worker’s level of experience.<sup>5</sup>

New workers are identified by the ustaads for their respective teams, and the ustaad’s selections are then (in most cases) approved by the management, who formally hire the workers. The most common way that workers get jobs at this firm is for the worker or a family member to contact the ustaad. According to our survey, just over half of the workers got their current job in this manner. Forty-three percent of workers initiated contact through current employees of the firm.<sup>6</sup>

### Moving to Assembly Line

Management expressed a desire to move production in the factory from batch to assembly line production. Given the current layout of the factory, which consists of a series of rooms (rather than a large, open factory floor), the extent to which production can be automated is somewhat limited. The

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<sup>4</sup> The factory is comprised of a series of rooms of varying size, resulting from the gradual and organic growth of the firm over several decades.

<sup>5</sup> Overall, the workers cite either seniority at GFC or years experience in the fan sector as the major determinants of nafri (59 percent). Only 38 percent of workers state that knowledge and skills (23 percent) or efficiency (15 percent) were the primary factors.

<sup>6</sup> In only 5 percent of cases did the ustaad directly approach the workers. These cases were all in the packing workshops.

physical layout of the building means that production will still have to be carried out in stages, with in-process inventory carted between workshops. However, the goal was to apply line production within workshops. The perceived benefits of the assembly line to management were that work could be completed in fewer hours (saving scarce and costly electricity) with a lower level of in-process inventory. Management expected that a reduction in in-process inventory would result in a lower defect rate, because limited space means that in-process components are often stacked and, as a result, damaged.

A primary challenge of the transition is that balancing an assembly line requires a constant number of workers to man each position. Moving to assembly lines, even just within workshops, necessitates several changes in worker behavior and practice. First, workers have to work at a fixed pace in concert with the other workers. Second, workers' daily attendance needs to be regular and they need to arrive at a fixed time, and take work breaks in a limited and coordinated manner.

#### Earlier Attempts at Changing Production

In 2010, the firm worked with a foreign technical advisor through the Small and Medium Enterprise Development Authority (SMEDA) on a project to move motor winding process from batch production to a mechanized assembly line. The resistance to the change was so severe that the delicate motors were falling off the assembly line onto the floor, and the project had to be abandoned. Management attributed the failure to difficulty adjusting to the pace of the assembly line in addition to workers' dislike of both the fixed hourly wage and lack of flexibility introduced by the assembly line. From the workers' perspective, batch production is more flexible. The ability to move workers from one task to another, or have a single worker do multiple tasks in succession means that, when production is in batches, workers are able to take breaks when they want during the day, and even take days off, without much disruption to the team. Additionally, since the batch method is the predominant way of organizing production in this industry (and many other industries as well) in Pakistan, skills are

transferable. Under batch production, workers frequently move between tasks. In our survey of the workers, about 40 percent of winders and sixty percent of packers report doing work different from their usual tasks at least once a week. From a worker's perspective, working on the assembly line results in less variety and flexibility in work, and also limits gains in human capital with value in other factories in Pakistan. The last fact makes them more dependent on their current job and less able to move between factories when better opportunities arise.

### Worker Survey

The survey sample contains 44 workers from four winding teams and 42 workers from four packing teams. The majority of workers, three-quarters, originate from Gujrat *tehsil*<sup>7</sup>. Just over one-third of workers (36 percent) consider themselves of the Jat *biraderi* or "clan"; this is higher among the packers (43 percent) than the winders (30 percent).<sup>8</sup>

The vast majority of workers have at least some formal schooling, and on average the workers of the winding workshop (which requires more skill) have more education. The median years of education is 5 and 7 years for the winders and packers respectively. Almost 90 percent of winding workers and three-quarters of packers have five or more years of education. Twenty-five percent of winders and ten percent of packers have 10 or more years of education.

Workers in the winding workshops also tend to have more years of experience working in the fan sector. Nearly 30 percent of winders have 10 or more years of fan sector experience, compared to 12 percent for the packers. On the other hand, just over half of the workers interviewed have less than five years of fan sector experience.

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<sup>7</sup> A *tehsil* is an administrative territory, similar to an American "county".

<sup>8</sup> Another 12 percent are Muslim Sheikh. Other *biraderi* represented include Aarain (8 percent), Butt (6 percent), and Rehmani (5 percent). Fifteen other *biraderi* have small contingents within the workforces of these two workshops.

### Lack of Regular Attendance

Workers are accustomed to having flexible work schedules. In particular, it is not uncommon for workers to take off time to do work – often related to agriculture – in their village. Also, cultural norms obligate participation of members of the extended family in various celebrations, including funerals and weddings, which can last several days. Finally, illness (of oneself or a family member) is often responsible for lengthy absences from work. Two-thirds of respondents reported taking scheduled leave (meaning that the ustad was informed) for family illnesses and deaths. Eighty-five percent said that they take off time for family weddings, and 20 percent take leave for other unspecified work. Only about 12 percent said that they took off time to perform agricultural labor on their own or another's land.<sup>9</sup> More than 80 percent of the workers report taking unscheduled leave. The unscheduled leave is more disruptive to production because the ustad cannot plan in advance for the absence. In most instances, unscheduled leave was taken for unexpected events (illness, death, or unspecified emergencies). However, some unexpected leave was for non-emergencies including weddings (13 percent) and other work (9 percent).

Worker turnover also contributes to frequent fluctuations in the size of teams. Just over a quarter of the workers surveyed (24 workers, or 28 percent), had left the firm at some point and later returned. Of these, about a third worked in another fan factory while away. Twenty-nine percent of workers had jobs at other firms in the fan sector prior to joining the firm studied here.

Workers like the option of taking breaks during the day, but state willingness to accept compensation for limited and coordinated breaks. Among the 85 workers we surveyed, more than half (58 percent) stated that they would be moderately to very unhappy if the ustad eliminated

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<sup>9</sup> Only 12 percent of workers report planting and owning land, with the average land ownership being 1.28 acres. On the other hand, almost 60 percent report planting family-owned land, with the plot size averaging nearly two acres.



tea/cigarette breaks.<sup>10</sup> On the other hand, 80 percent of workers stated that, if compensated PKR 25 per day (approximately \$0.30 at the time of the survey) they would be willing to take two daily breaks at set times<sup>11</sup>. These data come from hypothetical questions, but they address an important issue. If the disutility workers receive from the more rigid scheduling required for assembly line production is greater than the gain in productivity from moving to assembly line production, then the shift to assembly lines will not be profit-increasing for the factory.

The ability of a worker to arrive on time will partly be determined by the length of the commute and the mode of transportation. Three-quarters of workers reported a commute of 45 minutes or less, and about 10 percent said that it took an hour or more to reach the factory. Only 20 percent reported getting a ride (motorcycle or rickshaw) or riding a bus to work, while the remainder arrange their own transport (foot, bicycle, motorcycle, or rickshaw), signifying that workers are mostly not reliant on others to arrive on time.

### The Pilot

The goal of the firm is to move production toward an assembly line, for which a constant number of workers is needed on a daily basis. However, worker attendance has not been regular in the past. This has been only a minor concern given the batch production method. In preparation for the move to assembly production, we have piloted financial incentives to improve worker attendance. The eight teams involved in the pilot were evenly divided between the motor winding and packing workshops of the ceiling fan section. The project took place from February until June 2012.

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<sup>10</sup> However, only 25 percent reported taking any tea/smoke breaks the previous day.

<sup>11</sup> In the summer (high season), a junior worker in winding with high attendance can make Rs 5,000 – 10,000 per month, and a senior worker Rs 10,000 – 20,000. Junior packers with high attendance earn from Rs 3,500 – 5,000, and senior workers make Rs 5,000 – 8,000.

The incentives consist of bonuses to the workers for high monthly attendance.<sup>12</sup> We piloted a schedule of bonuses that was non-linear, rising steeply for perfect and near perfect attendance. Average absenteeism before the project began was about four working days per month. The factory operates every day except Friday and public or religious holidays. Two types of bonuses were tested in the pilot, to see which one (if any) was effective in improving attendance: i) an “individual” bonus, based on a worker’s own attendance record for the month, and ii) a “group” bonus, based on the team’s attendance record.

The schedules for the bonus payments are given in Table 1 and 2 for the individual and group bonuses respectively. The individual bonus payment is triggered if the worker misses four days or fewer in a month. In the months during which the pilot occurred, there were on average 26 working days per month.<sup>13</sup> The group bonus had the same schedule of payments, but was based on the number of days in the month that the team attendance target is met. The idea of the team target is that operating the assembly line requires a fixed number of workers. Highly varying attendance rates imply that the factory needs to have a larger number of surplus workers to fill in on the days with a large number of absent workers. Our rule of thumb for the team target was to reward the team for the number of days attendance reached at least 90 percent. If attendance reached this level every day, the factory would need only one additional worker in ten to man the production line. Since most of the absences are in some sense planned, the team bonus provides an incentive to coordinate these absences. The specific target for the team depended on team size. Since the number of workers per team varied, the target

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<sup>12</sup> The reason for a monthly (rather than bi-monthly) bonus was that salaries are calculated on a monthly basis. We discussed the possibility of using a shorter period for the bonus (say Rs 100 or Rs 200 for 12-13 days attendance every half-month) because we worried that if for some reason the target attendance was missed for several days during the first week or two of the month, then the workers might “give up” on getting the bonus and let attendance slide for the second half of the month. This idea was not pursued because it was deemed too administratively burdensome for the HR manager, whose buy-in to the project was already tenuous.

<sup>13</sup> Feb. 2012 had only 24 working days, and so the bonus was triggered by missing 3 or fewer days of work.

number of workers for an “n” sized team was n-1 for teams up to 14 workers, n-2 for teams of 15 – 24, and n-3 for teams larger than 24 workers.<sup>14</sup>

Table 1: Bonus Schedule for Individual-based Incentive

<b>Attendance</b>	<b>Bonus</b>
Perfect attendance – 4 days	PKR 50 (total) paid on top of salary
Perfect attendance – 3 days	PKR 100 (total) paid on top of salary
Perfect attendance – 2 days	PKR 200 (total) paid on top of salary
Perfect attendance – 1 day	PKR 350 (total) paid on top of salary
Perfect attendance	PKR 500 (total) paid on top of salary

Table 2: Bonus Schedule for Group-based Incentive

<b>Attendance</b>	<b>Bonus</b>
Target attendance met every day – 4 days	PKR 50 (total) paid on top of salary
Target attendance met every day – 3 days	PKR 100 (total) paid on top of salary
Target attendance met every day – 2 days	PKR 200 (total) paid on top of salary
Target attendance met every day – 1 day	PKR 350 (total) paid on top of salary
Target attendance met every day	PKR 500 (total) paid on top of salary

In the pilot, we wanted to understand the effectiveness of both individual and group based incentives, while also maintaining a sense of fairness. Given that we were working with a small number of teams, we decided to rotate the status of control team (no bonus), individual-based incentives, and group-based incentives through the teams (Table 3). From February to April 2012, there were 2-3 control teams, and the remainder on group or individual incentives. In May, all teams were moved to group-based incentives, because early results indicated that the individual-based incentives were having little impact. The tradeoff here is between fairness on the one hand and the possibility that eligibility for past bonuses might affect the response to a current bonus on the other. However, given the number of teams we had to work with, we would not have had a sample of sufficient size to make a clean and clear

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<sup>14</sup> The largest team had 26 workers at the pilot’s inception.

comparison of the effect of the two types of bonuses – or even one of them – if they were assigned purely at the team level.

Table 3: Control and Treatment Teams by Month

	<b>Ustaad</b>	<b>Workshop</b>	<b>February</b>	<b>March</b>	<b>April</b>	<b>May</b>	<b>June</b>
1	MM	Packing	Group	Control	Group	Group	Group
2	HU	Packing	Group	Individual	Group	Group	Group
3	JA	Packing	Control	Group	Individual	Group	Group
4	MA	Packing	Individual	Group	Control	Group	Group
5	AH	Winding	Individual	Control	Group	Group	Group
6	RS	Winding	Group	Individual	Control	Group	Group
7	IA	Winding	Control	Individual	Group	Group	Group
8	JS	Winding	Control	Group	Individual	Group	Group

If a team was assigned to the individual-based incentive treatment, then all members on that team were eligible to receive the bonus based on their own attendance. In other words, treatment was assigned at the team level. Assigning treatment status at the level of the worker was not possible, because it would have been both confusing to explain and a possible source of tensions within a team.

#### Implementation of the Incentives by the Firm

For the first three months of the incentives (February - April), a member of upper management handled the attendance incentive program himself. At the beginning of the month, he invited each team into a conference room and explained the incentive scheme. Then at the beginning of the

following month, he again called in the team, explaining the next month's scheme and why the team either received or did not receive the bonus.

In May and June, responsibility for the incentive program was handed over to HR manager, who was less engaged in the project. He did not call in the workers to tell the teams to what bonus schedule they had been assigned, nor did he give the workers an explanation for the bonus payments (or lack of) at the end of the month. As a result, most workers assumed that the incentive program was no longer going on. By July, the HR manager had stopped calculating the bonuses.

### Results

There are a number of issues which makes it difficult to draw firm conclusions from the data collected and the experiment conducted. First, the number of observations is small. The randomization occurred at the level of the team (rather than the worker), meaning that we have only 24 team-month observations, as the incentives were randomized over 8 teams over three months. Secondly, the incentives were rotated between teams, so that each team could experience each type of incentive and so that the program would not be perceived as unfair. Therefore, from month to month, some teams were going from control to treatment status, others were going from treatment to control status, and others still were changing from one type of incentive to the other. Therefore, when we take the average of some outcome (say coordination of absences with team) for those who were in the control group over the three months, we may not be getting a true measure of the control group. Rather, we are capturing a combination of the simple control group mixed with the effect of going from treatment to control status and vice versa. Similar problems will exist for the average outcome for all those on individual and group incentives as well.

The following discussion of results, therefore, is not intended to be scientific, but rather indicative of some patterns.

Table 4: Absences and Coordination of Absences by Treatment Status

	Control	Control - individual	Control - group
Average number of missed days	2.2	-0.68	-0.86
Average number of days absent when attendance target not met	1.17	-0.27	-0.72
<i>Number of observations (worker-months)</i>	<i>71</i>	<i>72</i>	<i>101</i>

As we can see in table 4, absences are lower with both types of incentives, but they are lowest for those workers on the group-based bonus. The average number of days missed falls by 30 percent with individual incentives and 39 percent with group incentives. But for the transition to assembly lines, maintaining the attendance target on a daily basis is more important than reducing absences generally; that is, coordinating absences among workers on the team so that a constant number of workers (at least 90 percent) are present on a daily basis. This idea is captured in the second row of table 4. This variable measures the “lack of coordinated absences”, or the number of days missed per worker when the attendance target is not met. Here, the difference between the individual-based and group-based incentives is larger, with uncoordinated absences lower by 23 percent and 61.5 percent respectively.

When we look at the individual absence rates by level of experience, the lack of coordination is lower under both types of incentives for workers with five or fewer years of tenure at the company, and the reduction in absences is greater under the group-based incentives than individual incentives. The group based incentives may have helped to improve coordination for all except for the workers of the longest tenure (greater than 10 years). A combination of factors may be a work here. Firstly, workers who have at least 5 years or more on the job already have regular attendance, and so there is not much room (or need) for improvement. Secondly, the bonus relative to the salaries of the more experienced workers is smaller as compared to less experienced workers. However, providing the entire team (and

not just junior workers) the bonus may be justified, because it gives the senior workers an incentive to put pressure on their more junior counterparts to come to work regularly.

Table 5: Lack of Coordination (average number of days missed when attendance target not met), by tenure at the firm

Feb – April	Control	Individual – Control (difference)	Group – Control (difference)
< 1 Year	0.63	-0.13	-0.43
<i>Observations</i>	8	12	15
1-5 years	1.97	-0.81	-1.28
<i>Observations</i>	33	32	48
5-10 years	0.76	0.38	-0.37
<i>Observations</i>	17	14	23
>10 years	0	0.43	0
<i>Observations</i>	13	14	15

In Table 6, we look at the relationship between lack of coordination and treatment status by social connection to the ustad, defined as being a relative of ustad, knowing ustad at the time of joining, or originating from the same village. In the absence of incentives, workers with a social connection to the ustad have surprisingly more uncoordinated absences. Those on group-based incentives exhibited improved coordination of absences regardless of connection to the ustad, but the workers with the fewest uncoordinated absences were those on group-based incentives without a connection to the ustad. The results for the individual level incentives were mixed; coordination was better for those without a connection to the ustad, but worse for those who were connected. It may be that when the ustad is unable to use a social connection to influence a worker, the bonuses may help.

Table 6: Lack of Coordination (average number of days missed when attendance target not met), by social connection to ustaad

	Control	Individual – Control (difference)	Group – Control (difference)
None	1.08	-0.48	-0.8
<i>Observations</i>	50	50	65
Some social connection with Ustaad	1.38	0.21	-0.63
<i>Observations</i>	21	22	36

The individual attendance patterns should be viewed in the light of incentives that individuals have for increasing the team attendance rates. A feature of the existing piece rate system is that those present each get a higher share of the day's production (wages) when some team members are absent. This limits the incentive for ustaad and other workers to pressure each other to come. It also limits the ustaad's incentive to increase the size of the "core" team, i.e. those present nearly every day. The increase in earnings an individual receives as a result of absences of other team members depends on that individual's share of the team piece rate – i.e., his nafri. We analyzed salary data from July 2011 (well before the incentive program) to see which type of workers gained more than 500 Rs. (the maximum bonus amount) as a result of the absence of other team members. These are the workers who might not have an incentive to pressure others to attend. We calculated the loss to each worker that would result if all workers had full attendance in that month. Overall, 32 percent of workers gained Rs 500 or more from the absences of other workers on their team. This figure is two-thirds for senior workers with nafri of 15 or higher. These workers would rather keep attendance at current levels rather than pressure other workers to come and get (at most) a Rs 500 bonus.

The gains from others' absences were typically higher for higher nafri workers. However, regardless of nafri, workers whose attendance was higher than their team's average tended to gain from the absence of other workers. 85 percent of workers with higher than team attendance experienced some



gain from other workers' absence. Among workers with higher than team average attendance, 46 percent gained at least Rs500 from the absence of other workers. This figure rises to 68 percent if we consider workers with perfect or near perfect (one absence) attendance.

From the results in table 7 and 8 below, we can see that the total gain from total absences on one's team is positively related to one's own nafri and attendance and negatively related to the team's average attendance.<sup>15</sup> Even if one's own nafri is relatively low, the gains can be high if one's own attendance is high and team attendance is low.

Table 7: OLS of worker level benefit from absences, conditional on positive benefit from absences

Number of obs = 68  
 R-squared = 0.7946  
 Adj R-squared = 0.785

	Coef.	t-stat
Nafri	61.44	10.13
Attendance	294.96	9.44
Average Team Attendance	-246.02	-10.03

Table 8: Tobit of worker level benefit from absences

Tobit regression  
 Number of obs = 114  
 Pseudo R2= 0.168

	Coef.	t-stat
Nafri	55.63	9.40
Attendance	346.39	12.09
Average Team Attendance	-280.31	-11.86

46 observations censored at 0

<sup>15</sup> We also tried including terms such as team size, squared team size, and dispersion of team nafri; these were sometimes significant but did not change much the magnitude of the coefficients reported here.

Table 9: Gain to workers from less than full team attendance, by nafri

Nafri	% who gain from less than full team attendance	Average gain from absences (when >0)	% with gain from absences more than Rs 500	% with Near or perfect attendance (at most one absence)	Average attendance	NOB
6	0.33	Rs. 90.96	0.00	0.33	21.22	9
7	0.50	506.08	0.21	0.29	21.57	14
8	0.48	461.99	0.24	0.29	20.38	21
9	0.75	464.74	0.25	0.63	23.75	8
10	1.00	459.72	0.33	0.33	23.83	6
11	0.57	754.44	0.43	0.29	20.14	7
12	0.50	782.06	0.25	0.42	24.00	12
13	0.50	587.03	0.17	0.17	15.17	6
14	0.33	1248.18	0.33	0.33	23.00	3
15	0.75	794.29	0.50	0.50	23.38	8
16	1.00	558.90	0.60	0.40	24.40	5
17	0.50	551.72	0.50	0.00	22.50	2
20	0.50	1127.01	0.50	0.50	25.00	2
21	0.50	450.35	0.00	0.00	22.00	2
22	1.00	1240.08	1.00	1.00	26.00	1
23	1.00	1296.49	1.00	1.00	26.00	1
24	1.00	1374.54	1.00	1.00	25.00	1
27	0.67	2878.43	0.67	0.67	25.33	3
28	1.00	747.63	1.00	1.00	25.00	1
30	1.00	2674.54	1.00	1.00	26.00	1
33	1.00	1196.82	1.00	1.00	26.00	1
Total	0.60	715.85	0.32	0.39	22.11	114

Table 10: Gain to workers from less than full team attendance, by deciles of nafri

Decile of Nafri	% who gain from less than full team attendance	Average gain from absences (when >0)	% with gain from absences more than Rs 500	Average attendance	Average Nafri
1	0.43	381.55	0.13	21.43	6.6
3	0.48	461.99	0.24	20.38	8.0
4	0.75	464.74	0.25	23.75	9.0
5	1.00	459.72	0.33	23.83	10.0
6	0.53	771.01	0.32	22.58	11.6
7	0.50	587.03	0.17	15.17	13.0
8	0.64	859.13	0.45	23.27	14.7
9	0.78	639.03	0.56	24.11	17.1
10	0.82	1637.48	0.73	24.91	25.7
Total	0.60	715.85	0.32	22.11	11.8

Finally, one further caveat to the results we have presented here. The peak production months of May to July are also the hottest, the workers get exhausted/sick frequently, particularly in the packing workshop. Despite the high opportunity cost of missing work, the rate of absences is generally high during this period.

#### Perceptions of the Program

In September 2012 (after the pilot had ended), we visited the firm to get the perceptions of management, ustaads, and workers about the incentive program. The ustaads seemed to be mostly positive about the scheme and understand the schedule of incentives. They knew that Rs 500 was the maximum bonus if target attendance was achieved for the entire month, and that lesser amounts were paid for having up to a few days less. They also said that they thought that the program had boosted

attendance, and that workers were attempting to coordinate absences better and avoid taking off for less important non-emergencies (such as work at home and weddings of more distant relations).

We also spoke to a few of the workers, in particular workers who had had a large number of absences. Those we spoke to understood that they could get Rs 500 if everyone was present the entire month, but did not remember any other details of the bonus schedule. They also had a hard time recalling when and how much of a bonus they had received in the previous months.

### Moving Forward – Next steps

In March 2013, the factory expanded the experiment to a total of 22 production teams, with half on the group incentive, and half as the control group for three consecutive months. After the third month, the control and treatment teams will be swapped. This way, we can get cleaner results on the effectiveness of the group-based incentives.

In addition, there are some modifications to the program. For each team, a monthly calendar will be placed in the workshops for each team, clearly stating the team's attendance target, and indicating on a daily basis whether or not the target was met. Given that workers (and especially the ustad) benefits financially from workers' absences, the bonuses will be doubled for the ustad for team's attendance in order to increase his incentive to put pressure on his team.

## References

Munir, Kamal and Usman Khan (2011). Fan Industry in Gujrat and Gujranwalla: SME Cluster Study.  
Lahore University of Management Sciences (LUMS), March 2011.

Appendix

Appendix Table 1: Lack of Coordination by Treatment Status on a Monthly Basis

	Control	Individual – Control (difference)	Group – Control (difference)
<b>February 2012</b>			
Average number of missed days	0.97	0.97	0.19
Average number of days absent when attendance target not met	0.00	0.83	0.06
<i>Observations</i>	36	18	31
<b>March 2012</b>			
Average number of missed days	3.13	-1.39	-2.28
Average number of days absent when attendance target not met	2.20	-0.85	-2.20
<i>Observations</i>	15	23	42
<b>April 2012</b>			
Average number of missed days	3.75	-2.62	-1.46
Average number of days absent when attendance target not met	2.50	-1.89	-0.96
<i>Observations</i>	20	31	20

Appendix Table 2: Lack of coordination by month and by treatment status for difference lengths of tenure at GFC

	Control	Individual – Control (difference)	Group – Control (difference)
<b>February 2012</b>			
<1 year	0	1.00	0.00
1-5 years	0	0.57	0.07
5-10 years	0	4.00	0.13
> 10 years	0	1.00	0.00
<b>March 2012</b>			
<1 year	0	0.50	0.00
1-5 years	2.4	1.10	-2.40
5-10 years	2.3	-1.30	-2.30
> 10 years	-	-	-
<b>April 2012</b>			
<1 year	2.5	-2.25	-1.75
1-5 years	3.7	-3.03	-1.41
5-10 years	1	-0.11	0.60
> 10 years	0	0.33	0.00

Appendix Table 3: Lack of coordination by month and by treatment status, by social connection to ustaad

	Control	Individual – Control (difference)	Group – Control (difference)
<b>February 2012</b>			
None	0	1	0.05
<i>Observations</i>	30	7	20
Social connection to Ustaad	0	0.73	0.09
<i>Observations</i>	6	11	11
<b>March 2012</b>			
None	2.83	-1.9	-2.83
<i>Observations</i>	6	16	33
Social connection to Ustaad	1.78	0.51	-1.78
<i>Observations</i>	9	7	9
<b>April 2012</b>			
None	2.64	-2.35	-1.23
<i>Observations</i>	14	27	12
Social connection to Ustaad	2.17	0.58	-0.54
<i>Observations</i>	6	4	16



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