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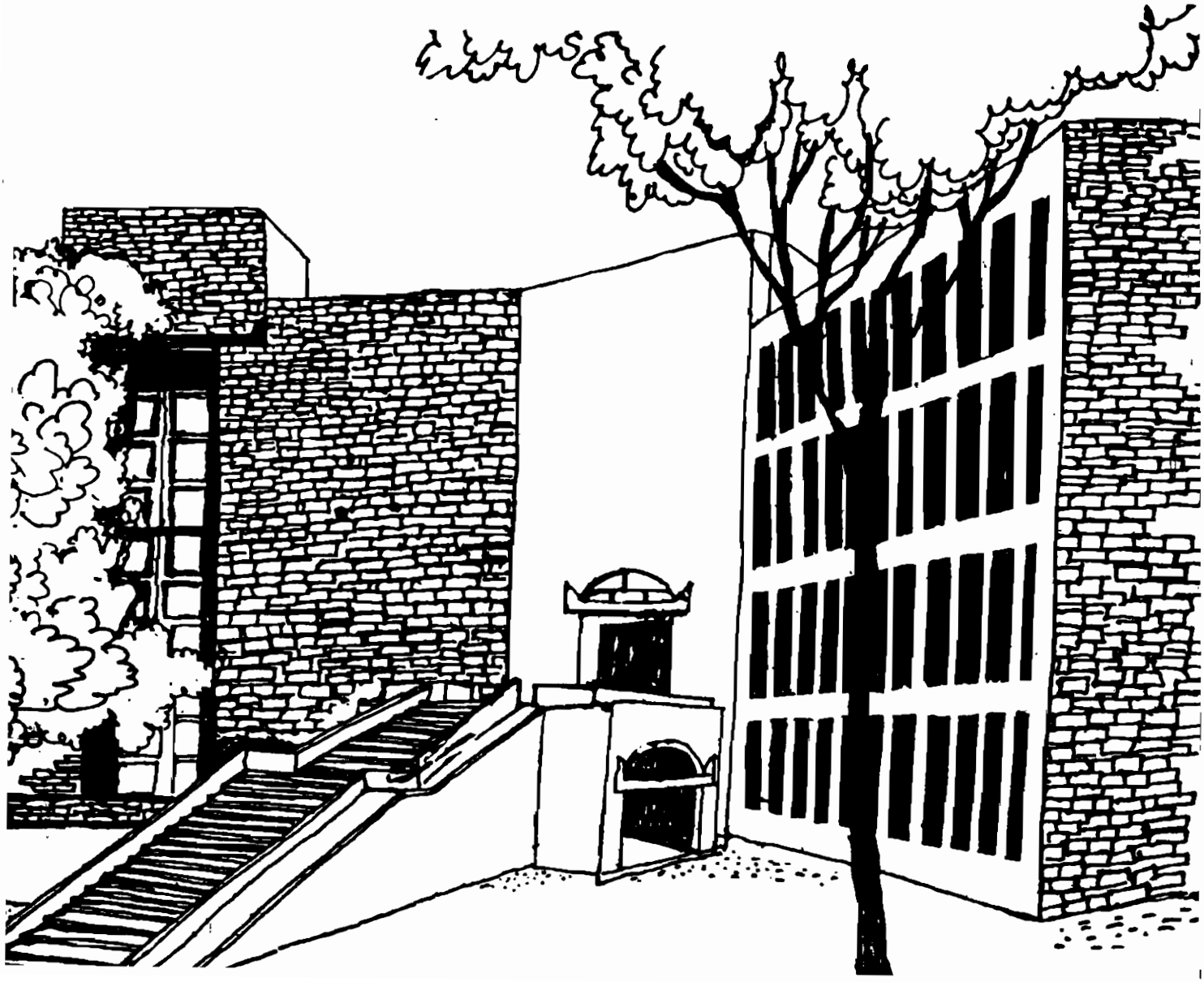

Organizational Practices and Employee's Performance: A Case of Canadian Textile Industry

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Abstract

This study undertakes empirical explanation of inter-firm variations in employee's productivity by a set of organizational factors on the basis of firm level survey data drawn from the Canadian textile industry. Organizational practices of high degree of monitoring and profit sharing are alternatives. The effectiveness of these alternative practices in eliciting high employee performance depends on the size of organizations and also adoption of complimentary practices. The results show profit sharing practices appear to be more effective in small firms than large firms.

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I. Introduction

Organizational practices and technology are observed to be one of major determinants of performance of firms in terms of total factor productivity and resultant differences market shares within industries. Their respective roles are complementary to each other in terms of some practices leading to better utilization of technology and simplification of managerial practices due to elimination of tasks and multi-skills. Japanese manufacturing regimes have shown how the two can be successfully combined to gain an edge in highly competitive markets. With increasing investments in technology due to various market reasons, the role of organizational practices in improving the performance becomes even more significant. This perception has led firms in several industries in North America to undertake organizational restructuring and adoption of novel incentive structures and employment practices, like flexible work schedules, job rotation, self-monitoring by teams, profit sharing etc, along with manufacturing practices like just-in-time to achieve high labour performance.

Why firms within an industry differ in size, technology and organizational strategies is explained to a certain extent by the literature on X-efficiency and the theory of firm in terms of differences in entrepreneurial abilities, bounded rationality and transaction costs (Leibenstein, 1987; Simon,1959; Coase,1937; Williamson,1979). Technological features of an industry in terms of fixed costs involved in production determine the minimum efficient scale of firms. Beyond this efficient minimum scale, why firms differ in size and efficiency within an industry could be explained partly by organizational factors, managerial abilities and market strategies.

Our objective in this paper is to examine empirically the explanation of inter-firm variations in labour productivity across firms by a set of organizational factors. It is not our objective to explain why firms differ in organizational abilities and size but rather assume the adoption of specific organizational designs and size of organizations as an exante outcome. Given their size, technology and skill levels and managerial competence, firms may choose different organizational practices towards eliciting high labour performance. This is because effectiveness of different organizational practices may depend on the size of an organization, technology and managerial abilities.

Alchian and Demsetz's (1972) view of a firm, principally as a monitoring entity, provides an explanation of employee performance by monitoring and measurement of effort designs within an organization. In this framework, the supervisor's evaluation of the employee's efforts are used for designing rewards for the latter. An alternative view was put forward by Holmstrom (1982) who argues that it is impossible to measure individual employee's performance in the context of team production. An employee, being the residual claimant (profit sharing) will provide her right incentives in her production decisions. On these lines, there is a large body of theoretical literature within the framework of principal-agent problem (Holmstrom and Tirole, 1989). The message that comes out of this literature is that effectiveness of different organizational strategies (i.e., practices), as alternatives or as complements in eliciting higher employee performance, depends on the meeting of certain conditions. For example, the effectiveness of profit sharing as an alternative to monitoring may depend on the size of organizations and teams within organizations. It also requires adoption of complementary organizational practices. When profit sharing is adopted across employees in horizontal uniformity it provides incentives for free riding and also to labour not performing full potential. In order to avoid these possibilities, organizations should adopt complimentary strategies that respond to differences in performance levels of employees in order to provide rewards for higher performance. These are in terms of schemes towards measuring effort or implementation of designs for self-monitoring by teams as well as effective employee suggestions schemes. The latter is aimed at motivating workers to reveal their private information about production. Similarly, adoption of job rotation that reduces monotony and help increase labour motivation requires adoption of complimentary practice of on-the -job training schemes. Or, the adoption of just-in-time practices may facilitate self-monitoring by teams. In other words, effectiveness of the different organizational practices depends on meeting certain organizational and technological conditions and several of the

practices have to be adopted as a set instead in piecemeal terms. (Ichniowski and Shaw, 1995; Arthur, 1994).[1]

In this paper, we study the role of organizational factors in explaining the inter-firm variations in labour productivity. We also examine the issue of how different organizational variables are complementary or alternatives to each other. In other words, does the probability of the successful implementation of some practices improve if they are implemented along with some other practices ? We have studied plant-level primary survey data from 62 Canadian primary textile firms. In the next section we briefly describe the structure of the Canadian textile industry and its performance. Next, we develop a framework for exploring the relationships between various organizational practices and labour performance. In section IV, we present the empirical results. Finally, we present our conclusions in section V.

II. Canadian Textile Industry: A Preview

The Canadian primary textile industry has undergone a drastic re-organization in terms of the number of active firms, employment and intra-firm organization during the last decade or so. By 1991, the number of primary textile establishments had dropped to 201 from 245 in 1975, the number of employees had reduced to 20,486 from 41,329 in 1975 and the hourly wages of the production worker had increased to C$ 12.54 from C$ 3.70 in 1975 (at constant C$). Interestingly, the total labour cost as percent of Canadian Shipments fell from 24.11 in 1975 to 22.77 in 1991 (Statistics Canada, Catalogue 31-203). Moreover, shipments per employee grew from C$ 36,440 in 1975 to C$ 1,55,020 in 1992 (C$ 1,25,720 in 1991) and capital expenditure (in new machinery and equipment) grew from C$ 131.6 million in 1975 to C$ 365.2 million in 1993 (C$ 224.1 million in 1991) in 1981 C$ [Statistics Canada, Catalogues, 31-203, 61-205]. The industry has modernized rapidly with a total capital and repair expenditure to the tune of C$ 6.2 billion between 1975 and 1993. Several new managerial practices like JIT, worker involvement programs, reduction in job classifications etc. have also been implemented actively by firms in this industry with varied effect (Chandra, 1996). Given these significant changes in organizational practices, it would be interesting to see how they explain inter-firm variations in labour productivity.

III. A Conceptual Framework

In the principal-agent framework, each employee's utility is a function of effort levels and wages. At any given level of wage rate, an employee's utility is higher for lower effort levels. The job of a supervisor is to ensure that shirking does not take place especially when the effort is observable and measurable. For simplicity, we assume that the supervisor does her job without shirking herself. The benefit, to the organization, of increasing the probability of labour being monitored is higher output per labour through reduced shirking. Monitoring may also check horizontal cooperation between labour towards slowing down work etc. However, monitoring involves direct and indirect costs to firms. Labour productivity should be higher with increased monitoring but the value of the firm, due to increased monitoring costs, may not increase commensurately.

In addition, the potential productivity of labour may not be realized by simply increasing monitoring. This is because of direct and indirect costs of monitoring and also a pure monitoring strategy may not motivate an employee to perform to her potential. One of the indirect costs is that it may lead to reduction of vertical trust between labour and managers. There could be negative utility associated with being monitored. Beyond some point, monitoring may send a message that the employee is not completely trusted. There may be costs involved in terms of employees shifting work away from the unobserved to observed activities (Leibenstein,1987).

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1 Arthur (1994) argues from a contingency theory perspective for a congruence between different organizational practices. Using data from steel mini-mills in the US, he empirically shows that by clustering human resource practices, one can choose those that have a better fit.

Labour may know more about production than managers. Effective monitoring itself may not motivate an employee to reveal her private information about production.[2] This is especially important where effort levels and productivity are not directly observable and measured fully. In Holmstrom's scheme, providing a share in the profits to workers (i.e., the residual output that may be accruing to supervisors) may instead provide right incentives to the employees.

Adoption of profit sharing does not mean monitoring of effort and corresponding rewards and penalties will be redundant. For it to provide right incentives, it should be able to respond to differences in productivity of employees which implies measurement of individual effort. Sharing of profits equally among employees, irrespective of differences in their effort and abilities, may provide incentives for free-riding. In addition, where team production is involved, measuring individual performance or effort becomes an extremely difficult task. Workers may be in a better position to monitor each other than management. In such cases, incentives like profit sharing linked to teams or groups rather than individuals may be more effective.[3] Under these possibilities, the effectiveness of profit sharing may depend on the size of the organization and size of teams within an organization. According to Alchian and Demsetz, profit sharing schemes might be more effective for smaller firms with smaller teams as it permits more effective reciprocal monitoring inputs than in the case of large organizations.

Profit sharing arrangements aimed at discouraging shirking by employees may be adopted not only because of monitoring costs are high relative to benefits, but also because team production may yield more output than via separate operations (Williamson, 1975; De Alessi,1983). Certain tasks can be performed only by teams (indivisibility of tasks). Even if a task is separable and can be performed by individual employees, team production may result in more output per worker. This depends on the nature of horizontal trust amongst employees. If it causes collective motivation through horizontal trust, it will lead to higher productivity. On the other hand, if horizontal trust may lead to collusion towards shirking and free rider motives. In such case, profit sharing schemes targeted towards teams like group bonus schemes might be more effective than its adoption in horizontal uniformity across workers.

Designing of incentives in terms of monetary rewards or increase in wages for higher performance under the adoption of monitoring practices might be more effective in large firms in comparison to small firms. Under the principle agent framework, the work of Holmstrom (1982), Nalebuff and Stiglitz (1983), and Mookherjee (1984) shows that explicit incentive schemes will generate sharper incentives the greater the number of players involved. This is because of the greater opportunities for comparison. How this may be possible within organizations is as follows. The opportunities for comparison of performance across a larger number of employees and implement appropriate incentives under monitoring would be more for larger firms than for smaller firms operating with fewer employees. In absence of this scope for comparison of performance across larger number of employees within the organization, a small firm may link the incentives of employees to its market performance (profit) by adopting profit sharing practices.

The effectiveness of profit sharing as an alternative to reduced monitoring requires adoption of complimentary practices. As mentioned earlier, measuring performance in terms of output or quality may be incomplete when revealing of private information of labour about production might be a very significant contributor to productivity. Incentive schemes like profit sharing adopted towards eliciting private information of labour may have to be complemented with adoption of effective employee suggestions schemes. Such practices may also help reduce informational asymmetry between the workers and management.

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2 The literature on 'principal-agent problem' distinguishes between two types of informational problems: those resulting from 'hidden actions' (moral hazard) and those resulting from 'hidden information'.

3 One example of this is adoption of group bonus schemes.

Milgrom and Roberts (1993) argue that employment security is necessary to elicit private knowledge of labour towards improving productivity because workers may be concerned that their ideas for improving productivity will jeopardize their own jobs or those of co-workers. Adoption of practices like multi-functional skills (via fewer job classifications) and just-in-time (JIT) may send signals of potential job loss to employees. In such a case, it may lead to lower vertical trust between managers and employees whereby employees will withhold their private information towards improving productivity [4]. This loss of vertical trust could take place both under profit sharing and high levels of monitoring schemes. Apart from this, adoption of practices like multi-functional workforce with fewer job classifications has to take care of trade-offs between economies of specialization and disutility or monotony associated with specialization.

Employment practices like flexible work schedules might be more consistent with profit sharing strategies rather than pure monitoring. One possible reason is that pure monitoring requires that work schedules of production supervisors and employees should coincide.

Implementation of team production practices do not necessarily imply indivisibilities of tasks as described by Alchian and Demsetz. Organizations may adopt team or work group practices as a part of the monitoring and incentive structure by delegating responsibility to teams. This in turn is expected to facilitate self monitoring by teams and evaluation of performance of team as whole as well as of the individuals within it. Teams collectively find solutions to problems after taking into account the implications of decisions on the activities of all the members. This improved coordination is found to improve implementation of suggestions leading to enhanced productivity (Katz et al.). This could lead to situations where the team output is proportionately more than the sum of individual outputs given appropriate incentives like profit sharing or group bonus system. Manufacturing practices like just-in-time require tight coordination between work-stations on the shop floor which is facilitated by formation of teams around a set of tasks. Teams, in this environment, undertake continuous improvement programmes (set up reductions being the most important) which are essential for the successful implementation of JIT.

IV. Empirical Analysis

The empirical exercise has two components. Initially we undertake empirical verification of substitutability between organizational practices of profit sharing and degree of monitoring. We test the proposition that profit sharing practices are more probable for smaller firms with smaller teams than for large firms. Later, labour productivity is explained by a set of organizational variables under alternative specifications. As this exercise is based on cross section firm level data, we take it to provide empirical regularities rather than as a strict testing of causalities [5].

Data

Data from 62 Canadian primary textile firms (i.e., firms that performed cotton based spinning, weaving and dyeing operations) was collected during the year 1992-1993 via a mail questionnaire that was followed up by interviews with the plant managers for about 30% of the firms. Data was collected on various aspects of plant management: structural features (i.e., employment, wages, investment in

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4 For example, in Japanese firms, just-in-time practices are implemented under the lifetime employment system. Moreover, JIT also facilitates absorbtion of any displaced labour from the core plant to the supplier plants due to the latter's proximity to the former. The suppliers set up plants for the core producer thereby requiring skilled workers.

5 As studies based on cross-section data in industrial organization have certain inherent drawbacks due to difficulties in identifying exogenous and endogenous variables, we take this exercise to provide certain empirical regularities rather a strict testing of casualties (See Schmalensee,1989). Several organization variables are measured in qualitative terms by adopting dummy variables.

technology etc.), managerial practices (i.e., JIT, employee motivation program, job classifications etc.), and performance measures (e.g., sales and defect rates). The firms represented a broad spectrum in terms of employment levels, annual sales and the type of production processes). Table 1 gives a characterization of the firms in the sample.

Table 1
Characteristics of the Firms Surveyed

Size of the Permanent Workforce	Number of units
1-125	41
125-250	14
250-375	3
375-500	1
>500	3
Annual Sales Volume (in C$)	**Number of units**
< 1 million	2
1-10 million	21
10-20 million	22
20-30 million	4
30-40 million	4
40-80 million	7
80-100 million	2

Measurement of Variables

We define the variables as follows:

L = number of workers employed;
S = size of firms in terms of total sales turnover (in C$);
DR = Defect rate of output (measured in terms of number of defects as a proportion of total quantity of output produced in the year);
PS = profit sharing, value 1 for firms adopting profit sharing and 0 otherwise;
M = degree of monitoring of labour,(number of supervisors/number of labour employed): higher is M higher is the degree of monitoring of labour ;
FW = flexible work schedules, value 1 for firms adopting flexible work schedules and 0 otherwise. Note that some firms in this industry allot a time window over which workers can report for work; workers inform the supervisor of their arrival schedule, often, several days in advance;
JIT = Just-in-time, value 1 for firms adopting just-in-time practices and 0 otherwise;
TP = team production, value 1 for firms adopting just in time practices and 0 otherwise explain TP. For example, in spinning processes, a team is responsible for placing/removing bobbins from the spinning machines, moving cans of filled bobbins to buffer areas & fixing thread breaks. Teams are either organized by tasks over a set of machines or all tasks on a few machines;
ES = employee suggestions schemes. Value 1 for firms adopting ES and 0 otherwise. Employee suggestion schemes is implemented by organizing meetings near the end of the shift via written suggestions dropped in suggestion boxes or through special suggestion contests; and
NJS = number of job classifications.

Labour (employee) productivity is measured in two dimensions: quantity of output per worker and quality of output per worker. Labour input is taken in terms of number of labour employed (L), adjusted for skills. Following Mefford (1986), labour can be adjusted for skills by taking it as:

$$\log L^{\wedge} = \log L + \log \text{labor skill} * \log L \qquad [1]$$

A proxy for skill levels could be the wage rate under the assumption that higher is the skill level, higher should be the wage rate. We have used wage rate in the sample as a proxy for skills and have adjusted labour input for differences in skills. Labour productivity (LP) in terms of quantity of output is taken as:

$$LP = \log \text{Sales} / \log L^{\wedge} \qquad [2]$$

To recapitulate, labour productivity depends on technology and organizational factors. The explanation of *LP* by technology factor is tested by regressing the following equation.

$$LP = -0.05 + 0.33 \log (TE/L) + u \qquad [3]$$
$$(0.7) \quad (16)^*$$

$R^2 = 0.81 \quad F = 256 \quad N = 62$

Figures in brackets are *t* values. * significant at 0.01 level.

TE is the expenditure by firms on technology during the last ten years (in C$). The residual component (u) in the above equation can be taken to be explained by organizational factors. The estimated residuals of the above equation are then used as the indices of labour productivity that can be explained by organizational variables. We call this variable *LPu*.

Labour productivity in terms of quality of output dimension is taken as per capita rate of defects per worker which is as follows:

$$LPq = \log (\text{Defect rate}/L) \qquad [4]$$

Results

Table 2 presents the correlation coefficient matrix for the organizational variables, which provides tentative evidence regarding the complementarity and substitutability among these variables. The positive correlation between *PS* and *M* suggests that profit sharing and high monitoring levels are substitute strategies. *PS* also shows high correlation with *TP*, *JIT* and *NJS*. Just in time (*JIT*) shows high negative correlation with *PS*, *FW* and *ES*. This provides suggestive evidence to the view that just-in-time practices may not be consistent with the vertical trust enhancing practices like profit sharing as they may give signal of job loss to labour . This could be a perception or a cue taken from *JIT* implementation in other Canadian industries. It also shows that Canadian textile firms are not implementing *JIT* in conjunction with other managerial practices. Firm size variables *S* and *L* are negatively correlated with profit sharing, flexible work schedules and team production practices. Profit sharing and its complementary practices appears to be more consistent with smaller firms than larger firms.

The following equation (5a) tests for the causal explanation of *PS* by firm size (*S*), and the degree of monitoring (as represented by the supervisor worker ratio, *M*). Alternatively, the number of labour employed (*L*) is also used to capture the size dimension in equation 5b. As discussed in Section II, the effectiveness of profit sharing techniques depends on size of the organization. Secondly, as discussed earlier, adoption of profit sharing does not mean absence of any form of monitoring. For profit sharing to be effective individual labour performance has to be measured for suitable

Table 2
Correlation Coefficients

	M	FW	TP	ES	JIT	NJS	SL	L
PS	-0.1	0.06	0.15	0.005	-0.10	-0.13	-0.2	-0.17
M		0.25	-0.04	-0.01	0.01	-0.26	-0.29	-0.34
FW			0.19	0.047	-0.22	-0.24	-0.18	-0.25
TP				0.42	0.057	-0.195	-0.09	-0.28
ES					-0.10	-0.13	0.17	0.02
JIT						0.15	0.10	0.01
NJS							0.54	0.60
SL								0.69

discretionary incentives in accordance with differences in labour performance. In order to capture this dimension, the variables are introduced in log form. The value of the estimated coefficients, which are elasticities, provide suggestive evidence to this argument. Since *PS* is a qualitative (dummy) variable we adopt Logit maximum likelihood method of estimation, which tests for the probability of adoption of profit sharing as a function of the independent variables (Maddala, 1983).

$$PS = -0.32 \log S - 1.3 \log M \qquad [5a]$$
$$(2.8)^* \qquad (1.95)^*$$
log-likelihood = -23

$$PS = -1 \log L - 1.11 \log M \qquad [5b]$$
$$(3)^* \qquad (2)^*$$
log-likelihood = -22 N = 62

Figures in brackets are *t* values. * significant at 0.01 level.

The signs of the estimated coefficients are similar and statistically significant for both 5a and 5b. The negative sign of the estimated coefficient associated with firm size variable implies that as firm size increases, the probability of adopting profit sharing declines. This is consistent with the argument that profit sharing strategies might be more effective for smaller firms (with smaller teams) than for large firms. The value of the estimated coefficient of S is significantly less than one in 5a. In case of 5b, in which L is the size variable, it is equal to 1.0. If one takes the specification of 5b as more reliable in terms of number of labour capturing the size dimension better than sales turnover, then one can interpret the result of 5b as follows: there appears to be an equi-proportionate decrease (increase) in the probability of adopting PS as firm size increases (decreases). The estimated coefficient associated with M has negative sign and takes a value closer to one. This result implies that as the degree of monitoring (i.e., number of supervisors for labour employed) increases, the probability of adopting profit sharing decreases proportionately. This supports the view that profit sharing and high degree of monitoring are substitute strategies. The main conclusion that can be derived from these results is that adoption of profit sharing appears to be more among smaller firms in the Canadian Primary Textile Industry. This provides support to Alchian and Demsetz's argument that profit sharing strategies might be more effective for smaller firms with smaller teams than for larger firms.

The following econometric exercise tests for the explanation of inter-firm variations in labour productivity by the organizational variables. We present two cases where labour productivity is represented in terms of quantity (equations 6a and 6b) as well as quality of output (equations 7a and 7b), as explained earlier. Profit sharing and degree of monitoring variables are introduced into the specification of the equation separately as they are substitute variables.

$$LP_u = 0.33\ PS + 0.48\ FW + 0.38\ ES + 0.3\ JIT + 0.17\ TP$$
$$(1.86)^{**}\quad (2.7)^{*}\quad (3)^{*}\quad (2.2)^{*}\quad (1.2)$$
$$+ 0.022\ NJS - 0.000026\ NJS{*}L \qquad [6a]$$
$$(3.6)^{*}\quad (1.65)^{**}$$

Standard error of the estimate = 0.5 log-likelihood= -41

$$LP_u = 9.2\ M - 17\ M^2 - 0.04\ FW + 0.19\ ES + 0.09\ JIT + 0.07\ TP$$
$$(9)^{*}\quad (6)^{*}\quad (0.37)\quad (2.3)^{**}\quad (1.12)\quad (0.4)$$
$$+ 0.009\ NJS - 0.000007\ (NJS{*}L) \qquad [6b]$$
$$(2.2)^{*}\quad (0.7)^{**}$$

Standard error of the estimate = 0.31 log-likelihood=-12 $N = 62$

* Significant at 0.01
** Significant at 0.05

The statistical significance of the above estimations is reasonably high. The signs of the estimated coefficients of the organizational variables in equation 6a are quite appropriate. Profit sharing is explaining labour productivity positively. The relationship between degree of monitoring and labour productivity is significantly non-monotonic. The statistically significant positive and negative signs of the estimated coefficients associated with M and M^2 respectively in equation 5b imply that labour productivity increases until a critical level of M and thereafter it declines as degree of monitoring increases. This result provides support to the argument of the previous section that increasing degree of monitoring may contribute positively to labour performance until a critical level but beyond that it may be counter-productive. High degree of monitoring leads to increase in costs of monitoring which reduces the value of firm. It may also reduce vertical trust between workers and managers with workers shifting their efforts more towards the observable.

Number of job classifications (*NJS*) variable captures the economies versus dis-economies of specialization of labour in explaining labour productivity. In other words, higher the number of job classifications for a given level of workers higher is the specialization. Lower *NJS* (for a given level labour employed) can be taken to imply multi-functional workforce. As *NJS*'s explanation operates through the scale of employment in a firm, we have also introduced *NJS* as an interactive variable with workers employed (L) in the equation. The estimated coefficients associated with *NJS* and *NJS*L* variables are statistically significant in the case of equation 6a. The positive and negative signs and the respective values of the estimated coefficients associated with *NJS* and *NJS*L* variable show that labour productivity increases till a scale of 846 labourers employed and thereafter it declines as *NJS* increases. In other words, the gains in economies of specialization of labour might be more dominant for smaller firms than for larger firms (where size is taken in terms of number of labour employed). Incidence of workers performing multiple tasks may tend to be high among small firms. Small firm would be better off increasing the specialization of workers till a critical scale. In case of larger firms, increasing multi-functionality amongst the workers enhances productivity. In other words, till a critically large scale, economies of specialization of labour is important and beyond this scale firms may have to adopt organizational strategies that facilitate increase in multi-functionality of employees towards minimizing monotony in work. Keefe and Katz (1990) also found that the reduction in job classifications in the automobile industry led to small improvements in quality and slight reduction in

supervisor to worker ratios. However, their extent depended on different occupational groups within the plants - the effect was maximum when such changes accompanied changes in work processes.

The estimated coefficient of flexible work schedules (*FW*) variable is statistically significant in case of 6a but insignificant in 6b. As mentioned earlier, flexible work schedules may be more conducive with profit sharing strategy rather than high degree of monitoring. The estimated coefficient associated with *TP* is statistically insignificant in both the cases.

The results of explanation of labour productivity in terms of quality of output (i.e., defect rate in output per worker) are as follows:

$$LP_q = -2.5\,PS - 2.5\,FW - 3.86\,ES - 2.6\,JIT - 1.3\,TP$$
$$\quad (1.83)^* \quad (1.87)^* \quad (3.8)^* \quad (2.6)^* \quad (1.18)$$
$$- 0.015\,NJS + 0.00012\,NJS{*}L \qquad [7a]$$
$$\quad (3.4)^* \quad (1)$$

Standard error of the estimate = 3.8 log-likelihood= -167

$$LP_q = -62\,M + 132\,M^2 + 0.7\,FW - 2.8\,ES - 1.56\,JIT$$
$$\quad (6.5)^* \quad (5.4)^* \quad (0.6) \quad (3.5)^* \quad (1.9)^*$$
$$- 0.55\,TP - 0.07\,NJS + 0.005\,NJS{*}L \qquad [7b]$$
$$\quad (0.6) \quad (1.85)^{**} \quad (0.009)$$

Standard error of the estimate = 2.9 log-likelihood = -151 N=62

Figures in brackets are *t* values.

* Significant at 0.01 level

** Significant at 0.05 level

The above results are quite consistent with the results of equation 6 in terms of signs obtained for the estimated coefficients and also the statistical significance. Firms adopting profit sharing strategies appear to have lower defect rate of output than the others. In the case of degree of monitoring variables, the respective negative and positive signs of the estimated coefficients of M and M^2 imply that the per capita defect rate of output decreases till a critical level of monitoring but thereafter it increases as M increases. In this case, the interpretation should be drawn more from the argument of negative utility of labour and workers shifting effort more to the observable rather than non-observable activities because of high degree of monitoring rather than from the argument of high costs of monitoring. This is because the dependent variable is per capita defect rate while in the previous case it is per capita output.

The estimated coefficient of *FW* variable is statistically significant when introduced with *PS* in 7a but not with M in 7b which is similar to the results of equation 6. As mentioned earlier, flexible work schedules may be more consistent with profit sharing strategies rather than high degree of monitoring in explaining labour productivity.

As before, the estimated coefficient associated with *TP*, although it has appropriate sign, is not statistically significant. The negative signs of the statistically significant estimated coefficients associated with *ES* and *JIT* imply that the adoption of these strategies contribute positively to quality of output. These results are quite similar to the results of equation 6. Although the signs of the estimated coefficients of *NJS* and *NJS*L* variables are consistent with the previous results of 6, but the coefficient associated with the interactive variable is statistically insignificant.

V. Conclusions

In recent times, firms are increasingly resorting to organizational restructuring in order to face increasingly competitive market conditions through cost efficiency. Some of these practices that are aimed at improving labour productivity are increasing multi-functionality of labour, just-in-time

practices, flexible work schedules, incentive structures like profit sharing and group bonuses etc. The principal-agent theory of organizational structure shows that there may not be a general model under which these practices bring in optimal results. In other words, the efficacy of these practices depends on specific conditions. For example, the effectiveness of profit sharing practices may depend upon the size of the organization and adoption of other complementary practices. Employee motivational practices leading to increase in labour productivity could result in shedding of labour by firms. This, in turn, may increase job insecurity to employees which can be a de-motivating mechanism. The effectiveness of these practices depends on the ability of management to realize some of the trade-offs and adopt complementary mechanisms. This paper has examined empirically the issue of complementarity among certain organizational practices and has attempted to explain labour productivity through these practices on the basis of firm level survey data for the Canadian textile industry.

The Canadian textile industry has experienced significant organizational restructuring during the last few years. As a consequence, the labour productivity, in terms of shipments per labour has increased 2.45 times between 1975 and 1991 and has led to the shedding of labour by about 50% during the same period. There is a significant level of dispersion in firm size distribution in this industry and firms differ significantly in organizational practices and strategies. The empirical results show that profit sharing is a substitute for high level of employee-monitoring. Smaller firms appear to be more prone to adopt profit sharing incentives than larger firms. This gives support to Alchian and Demsetz's argument that profit sharing as an alternative to monitoring might be more effective for smaller firms with smaller teams as smaller organizations may facilitate self monitoring by inputs. Increasing the degree of monitoring contributes positively to employees productivity until a critical level and beyond this it results in lower productivity. In other words, after a critical level of monitoring the direct and indirect costs of monitoring tend to dominate.

Adoption of flexible work schedules is more in tune with profit sharing than high levels of monitoring. At a small scale of operation, increasing multi-functionality of labour, by reducing number of job classifications, may lead to lower labour productivity by dissipating economies of specialization. But beyond a critically large size of organization, increasing multi-functions of employees contributes positively to productivity.

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