

Draft

ADOPTION AND TERMINATION OF EMPLOYEE INVOLVEMENT
POLICIES

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Abstract

Employee Involvement (EI) programs in American manufacturing have been increasing, but these policies have not been universally successful. Many of these high performance workplace practices are not implemented properly or are abandoned. Yet the vast majority of research focuses on the adoption of these policies with little attention to those that are eliminated. Using a 10-year longitudinal database on U.S. manufacturing in union and nonunion establishments obtained through detailed plant visits, the study examines the trends and determinants of the adoption and termination of EI policies. The study develops an anatomy of employee involvement policies in the establishments of the most and least used elements of the overall policy. In addition, we compare the anatomy of EI in our sample to those in other similar studies. We find that the plants that have a high EI use are more likely to adopt another EI policy and more likely to abandon them as well; and that a set of other policies that are potentially complementary with employee involvement also affect the rate of adoption and decline of EI policies. Finally, we find that firms with higher levels of EI utilization have lower turnover rates.

I. Introduction

One of the most visible and widely discussed human resources policies in American business has been the development of employee involvement (EI) programs – a diverse set of personnel and human resources management (HRM) practices that give workers more authority at workplaces and promote their involvement in business decision-making processes. These practices include, for example, total quality management (TQM), self-directed work teams, and suggestion systems.

The major findings by Freeman and Rogers (1999) showed that voice through employee involvement programs is the most sought-after policy by American workers. The Presidential Commission on the Future of Worker Management Relations, often referred to as the Dunlop Commission, lists employee involvement as one of its main recommendations for improving the quality of work life and U.S. productivity (Commission on the Future of Worker Management Relations, 1993-1994).

Previous studies have mainly focused on two issues: who adopted EI policies and the impact of EI on organizational level outcomes. The findings showed that EI adopters are often organizations that operate in competitive product markets. They also have to respond to the market quickly and flexibly, and use new technology that requires highly skilled workers. They tend to follow business strategies that emphasize quality and innovation rather than low cost, and have adopted complementary human resources (HR) practices, such as high levels of training and incentive compensation plans (Osterman, 1994, 2000; Arthur, 1992; Ichniowski et al., 1995; Pil and MacDuffie, 1996; Dunlop and Weil, 1996; Gittleman et al., 1998).

Studies on the impact of EI on organizational performance are conflicting. Some studies find that EI promotes higher productivity, improved quality, higher customer satisfaction, lower quit rates, and greater sales (Arthur, 1994; Ichniowski et al., 1997;

MacDuffie, 1995; Huselid, 1995; Banker et al., 1996; Berg et al., 1996; Dunlop and Weil 1996; Batt, 2002; Batt et al., 2002; Bartel, 2004). Other studies emphasize the intermediating effect of business strategy on the relationship between EI and financial performance (Huselid, 1995; Youndt et al., 1996). However, other analyses on the benefits of EI on performance show that the impacts are generally small and that the high cost of implementing EI practices often offsets the benefits (Freeman and Kleiner, 2000; Cappelli and Neumark, 2001). Nevertheless, EI has undoubtedly increased employees' morale and satisfaction, which may explain their association with lower quit rates (Freeman and Kleiner, 2000; Hunter et al., 2002).

Although EI programs have been increasing, these policies have clearly not been universally successful. For example, case study evidence shows that firms have chosen to abandon these policies when they have not performed well (Kleiner et al., 2002).

Unlike most other studies, we examine the adoption as well as the decline of EI. We use data that cover 10 years of information on human resource and business strategy from manufacturing establishments. Consistent with other analysis, our data show that EI use has been rapidly increasing in establishments during this period. However, EI use has also declined in some establishments suggesting that estimates of the impact of human resource policies on performance should also take into account the decline of these policies in order to present less statistically biased evaluations of these programs.

While many studies have examined why firms adopt EI policies, fewer have examined why firms abandon them. Among the latter, several studies have noticed the high failure rates of Quality of Work Life (QWL) and Quality Circles (QC) (Goodman, 1980; Rankin, 1986; Drago, 1988; Eaton, 1994). Eaton (1994) finds that the failure rate of employee involvement practices is about 20 percent in union establishments, and she investigates the role of unions and labor-management relations in causing terminations.

Our study examines not only the role of union and nonunion establishments, but also the impact of business strategy, management style, and complementarity between different human resources programs on the decline in EI use. In addition, our study calls further attention to the termination of employee voice policies in manufacturing plants. This is particularly important in the estimation of the importance of high performance workplace practices on firm performance, because almost all studies focus only on the adoption of these policies. This flaw in the research design is likely to bias upwards the estimates of the importance of EI and related policies on firm performance.

The rest of the paper is organized as follows. Section II describes data used in the analysis collected by the National Bureau of Economic Research Human Resources Management Survey (NBER HRM). Section III describes patterns of EI diffusion and decline. Section IV provides the rationale for the adoption and termination of EI. Section V presents empirical methods and results. A summary and conclusion are contained in Section VI.

II. Data

In 1994, the NBER HRM survey was generated from more than a hundred plants randomly selected from the complete list of manufacturing establishments at the U.S. Census Bureau's Census of Manufactures. The survey was conducted on-site. To save the cost of field trips, establishments in the Midwest area, close to the University of Minnesota where the survey team was assembled, were over sampled. After initial contact, 51 plants agreed to participate in the survey and allowed researchers to visit the plant and conduct interviews. The researchers asked for and received written documents on policies within the plants from plant managers and first-line supervisors or other officials, and follow-up visits to the plants resulted in greater verification of the data than

that obtained in other short-term data collection efforts such as mail surveys or phone calls.

From 1995 through 1997, the survey team paid on-site visits to the plants. During the visits, which often included multiple return trips, the survey team collected written documents that the plant was willing to share to obtain knowledge about business environment, technology, and production of the plants, and interviewed managers, workers, and union representatives to conduct the survey. The NBER HRM survey provided more detailed and accurate longitudinal information than the large-scale surveys conducted via phone or mail since it obtained written documentation on the policies. However, one disadvantage is the data's relatively small sample size, given the costly nature of the data collection effort.

The survey asked questions about the plants' recruiting and selection, training, performance evaluation, employee involvement, and financial participation practices, as well as business strategy, management style, and basic information about the plant. For HR programs, managers were asked whether the plant has adopted a certain program since 1986, if yes, which year, whether the program was still in use and, if no, which year the program was terminated. Specifically, selection and staffing programs include whether the company had a detailed screening process, personal interview, aptitude test, physical exam, reference check, and probationary period. Training programs include whether the company offered on-the-job training, training in team building, on-site training, and tuition reimbursement. Performance appraisal policies include whether the company used assessment centers, formal review sessions, and a standardized form to evaluate their employees periodically. Employee involvement and communication practices include whether the company adopted job rotation, suggestion system, Quality of Work Life (QWL), Quality Circles (QC), total quality management (TQM), self-

managed work teams, job redesign, joint labor-management committee, and employee representation on the board of directors. Finally, financial participation programs include whether the company adopted an Individual Incentive Plan, Employee Stock Ownership (ESOP), Cash or Deferred Profit Sharing, Gain Sharing, Skill-Based Pay, Employee Stock Purchase Plan, and Group Bonus.

Managers interviewed were also asked whether there had been changes in the plant manager/production leader since 1986 and, if yes, how many. Then the management style of each manager was rated on a 1 to 5 scale with 1 representing “Close Monitoring” and 5 representing “Gives Employee Autonomy.” Four categories of business strategy were included in the survey: Growth of the Market Share of the Firm, Obtain a Specific Market Niche, Short-Term Profit Maximization, and Maximizing Shareholder Value of the Firm. The emphasis of the current manager on each of the four strategies was rated on a 1 to 5 scale with 1 indicating “a little” and 5 being “a great deal.” Managers were also asked whether the plant had undergone major restructuring since 1986 and, if yes, which year. All of the above responses were converted to yearly observations. The basic information about plants was time-constant. The questions included which year the plant was built, whether the company had union representation, and the average yearly turnover rate. Unlike the data gathered and analyzed by Eaton, our sample had 54 percent- unionized establishments.

III. Trends in EI Use

As can be seen in Table 1, in 1986, at the beginning of the period covered by the survey, 76 percent of the plants in our sample had adopted some EI programs. By 1995, this number had increased to 96 percent. The number of companies using a “bundle of programs” also greatly increased. Even in 1986, the percentage of plants that adopted two or more programs was 55 percent, and this percentage increased to over 90 percent

by 1995. As Figure 1 suggests, by 1995, job rotation was the most frequently used EI policy. A little over 75% of plants in the sample adopted it. The second most popular program is joint labor-management committee followed by suggestion system and TQM.

Table 2 shows the anatomy or structure of EI policies for the establishments in our sample (Freeman et al., 2000). The table shows that the most common form of EI are joint labor-management committees along with suggestion systems, but that worker participation on corporate boards is the highest form or least used form of EI. Moreover, policies such as self-managed teams suggest that a small percentage of establishments have evolved to a high level of employee involvement.

Although the trend was toward increasing EI, during some periods the percentage of companies and the extent of EI use declined. The downward trend was caused by the termination of programs. In Table 3, we show the number of companies adopting or terminating programs by year. The diffusion of EI sped up after 1990. An exception was employee representation on the board of directors. At the beginning of the period, only two companies had adopted the policy of having employees on the boards of the company. In the 10-year period, one additional company adopted the program; however, another company later abandoned the program. At the end of the time period, only two companies still had the policy of giving employees a voice at the top-level decisions of management.

In general, termination of EI programs is less frequent than adopting the programs. QC and TQM are the two programs that have most frequently been terminated, suggesting that these two programs may be less effective or that other programs may be substituting for them. A substantial number of terminations occurred between 1988 and 1991, which was a downturn in the business cycle, suggesting that financial difficulties may lead companies to abandon some EI programs to cut costs. In Table 4, we show the

number of years the program is used before it is terminated. For most programs that are terminated, the average time a program is in existence is four to five years. For suggestion systems and employee representation on the board of directors, the average time to termination is six years. Figure 2 shows the anatomy of the adoption and termination of EI policies. The adoption and termination seem to be negatively correlated. As the number of programs adopted increases, the number of termination declines. This may be explained by the learning effect: companies learn to implement EI policies more effectively as they adopt more programs, and thus the probability of failing declines. However, more probing of the firms in our sample is needed to discover the most important determinants of EI adoption and termination.

IV. Rationale for the Rise and Fall in EI

One of the central issues in the EI literature is, what leads firms to adopt or terminate EI? Interviews with plant managers, first-line supervisors, and plant tours provided us with firsthand knowledge (Helper, 2000). In addition, previous research suggested additional factors that may impact the adoption and termination of EI.

Business Strategy

Companies emphasizing service, quality, variety, and employee commitment are more likely to adopt EI than those focusing only on low costs (Arthur, 1992; Osterman, 1994). The performance effect of EI is also conditional on the type of strategy adopted by companies (Youndt et al., 1996). If the switch was from a low-cost policy to emphasizing service and quality, then it led companies to adopt EI. Conversely, a change in the strategy in the opposite direction may cause companies to terminate EI.

The NBER survey did not ask about the emphasis on low-cost production. Of the four types of strategies asked in the survey, short-term profit maximization may be the

closest to the low-cost strategy because companies that pursue maximizing short-term profit may be most likely to resort to cost cutting to increase profits. On the other hand, companies targeted at the growth of market share will be more likely to adopt and least likely to terminate EI because these companies need to rely on employees' commitment and innovation to attract potential new customers. Companies focusing on a niche market have loyal customers and face less cost pressure, and thus may not need to cut programs to save costs. Nevertheless, they may be less likely to adopt EI because their emphasis is on task specialization and greater output. Whether companies that pursue shareholder-value maximization are more or less likely to terminate EI depends on shareholders' interests and whether these interests are short term or long term.

Complementarity

In the EI literature, considerable evidence has suggested that a complementary bundle of EI practices generate greater performance effects than a single program (Ichniowski et al., 1995, 1997; Delery and Doty, 1996). This is because some programs add to the impact of each of the others. As our data show, the percentage of plants using multiple programs has increased remarkably over the 10-year period, suggesting that companies also have comprehended complementarity between programs.

Since there is complementarity between EI programs, if a firm adopted an EI program, it would be more likely to adopt another complementary program later. Moreover, firms that have had experience implementing EI, have better knowledge of the problems that may arise during implementation. They are consequently better equipped to deal with these problems and their implementation costs will be lower. Moreover, adopting a bundle of programs and past experience implementing EI increase the potential that the companies will succeed in adopting a new program and cause companies to be less likely to abandon EI.

EI and other HR practices are also complementary. For example, firms that have extensive training and incentive pay programs are more likely to adopt EI (Osterman, 1994; Pil and MacDuffie, 1996; Whitfield, 2000; Gittleman et al., 1998). Therefore, companies that have adopted other complementary HR programs would also be more likely to adopt an EI program. As companies succeed in implementing EI and other supportive HR policies, they will be less likely to terminate EI.

Unions

Unionization is sometimes associated with low EI use. Unions sometimes see EI as a substitute for their function in the organization and may prevent companies from adopting EI practices. In addition, nonunion firms see EI as a policy to keep union out of their establishments (Freeman and Rogers, 1999). If companies have adopted EI, unions may oppose the program in order to terminate it as a competitor for the services that unions may provide within the organization. Furthermore, employees may want EI, and firms may see EI as a substitute for unions. Yet, if properly implemented, EI can increase the voice of employees and result in more autonomy. Under these conditions, unions may support EI policies (Eaton, 1994).

Establishment Age and Restructuring

The plant's age can also impact the adoption of the EI practice. New plants have an advantage in adopting EI because they face less transition cost and resistance from employees than plants that have existed for a long time (Ichniowski et al., 1995). If older plants facing greater transition costs and employee resistance are more likely to fail in implementing EI, then older plants are also more likely to terminate EI.

For older plants, restructuring is like resetting the age clock of the plant. During restructuring, old organizational routine, structure, and culture undergo dramatic changes.

If firms introduce EI at this time, they deal with the transition cost and resistance all at once and save the cost of having to deal with them again if EI is implemented at a later date. Moreover, if EI is introduced after a recent restructuring, both organizational structure and culture change to fit with EI. As a consequence, EI implementation may encounter less resistance, and the performance effect of EI may be greater; thus firms will be less likely to terminate these programs.

In addition to firm characteristics discussed above, size, technology, and product market conditions also affect the adoption decision. Large firms are more able to afford the costs of implementing EI than small firms since this is a fixed cost that can be spread over a large number of workers with lower costs per employee. Consequently, large firms are more likely to adopt EI. However, size may not affect termination because if both large and small firms have invested in EI, the investment cost is a sunk cost and should not affect the firm's decision to end the program. The introduction of new technology and the increased market competition both drive companies to adopt EI. Many of the interviewed companies cited increased competition and new technology as the reasons why the companies adopted EI. However, technology and market conditions have hardly reversed, so none of the companies indicated that changes in technology or market conditions are responsible for their terminating EI.

V. Empirical Methods and Results

Rasch Measure of EI Use

To investigate the rise and fall in EI, we developed a measure of EI use in organizations. In the literature, many studies used a composite index of EI, which is calculated based on the adoption and score of several specific EI programs (Ichniowski et al., 1995; Pil and MacDuffie, 1996). The measure we developed is based on the estimates of the Rasch model. The advantage of the Rasch model is that it allows us to estimate the

extent of EI use in companies while taking into account differences across programs in the difficulty level of the programs. The Rasch model regards the probability that a plant has a certain program as a function of plant and EI policy characteristics:

$$P(X_{ij} = 1) = \Phi(\theta_i, \gamma_j), i, \text{ establishment}, j, \text{ EI practice}, \quad (1)$$

where θ denotes the degree of employee involvement in an establishment, which is considered a latent characteristic of the establishment, and γ also denotes a latent variable indicating the difficulty or higher level of an EI program. The probability that an establishment had a certain EI policy depends on an establishment's degree of EI use (θ) and the difficulty level of an EI program (γ). The function Φ is specified to have a logistic form, and equation (1) becomes

$$P(X_{ij} = 1) = \frac{\exp(\theta_i - \gamma_j)}{1 + \exp(\theta_i - \gamma_j)}, i, \text{ establishment}, j, \text{ EI practice}. \quad (2)$$

Then, the maximizing likelihood estimation (MLE) method is used to estimate the establishment parameter (θ) and the EI policy parameter (γ)¹. The estimates of θ are used as the measure of EI use in plants. Its value ranges from -1 to 1.

Estimating the Models

Using the Rasch estimate as the dependent variable, we first estimate an OLS model to examine the determinants of the level of EI use in plants. The model is estimated by pooling observations from all years. We then examine the impact of degree of EI use on the employees' turnover rate. Finally, we examine the determinants of adoption and termination of EI in organizations. EI adoption equals one if a company adopted any EI program in a year. EI termination equals one if a company ends using one

or more EI policies in a year. Using these variables as the dependent variables, we estimate the following two models:

$$A_{it} = X_{it}\beta + \alpha_i + \gamma_t + \varepsilon_{it} \cdot$$
$$T_{it} = X_{it}\beta + \alpha_i + \gamma_t + \varepsilon_{it} \cdot$$

A_{it} indicates EI adoption in year t , and T_{it} indicates EI termination in year t . X_{it} are a set of time-varying explanatory variables, such as age of plant, management granting autonomy, the current EI use denoted by the Rasch value, whether the firm has undergone a major restructuring, other HR practices, and time-constant variables such as union representation. The business strategy of only current managers was asked in the survey. Current managers may start in 1986 or before, or may have been in the position for only a few years. Therefore, some values for business strategy variables are missing. Definition and descriptive statistics of explanatory variables are reported in Appendix Table. Furthermore, α_i denotes individual plant dummy variables, which are included to control for the plant fixed effect, and γ_t indicates year dummy variables to control for the year fixed effect.

The two equations are specified as the linear probability model with White Robust standard errors to make the interpretation coefficient estimates straightforward. The estimates of linear probability model indicate marginal effect. In order to check for the robustness of results, we have also estimated Probit and Logit specifications and calculate marginal effects at the means of explanatory variables. The results are similar, but not reported in the paper.

Estimates of the Level of EI Use

¹ The estimation algorithm is provided by Quest, a computer software package. Using Quest, we calculate the Rasch measure of EI system for each establishment and the Rasch measure for γ_j indicating the

As can be seen in column (3) of Table 5, companies with other HR programs, such as training, selection, performance appraisal, and the group- or firm-level incentive pay, had a higher level of EI use than companies without these HR programs. Moreover, a higher level of EI use was also found in companies following a strategy that emphasizes growth of market share and in companies whose managers emphasize giving employees autonomy. On the other hand, companies with union representation and that recently experienced restructuring had a lower level of EI use. Most of these results are consistent with findings of the previous research in the literature.

Determinants of the Adoption and Termination of EI

In Table 6 we give the change in EI use over time, specifically, the adoption and termination of EI. Initially, the results show that, a higher Rasch value of EI increases the probability of adopting EI policies. This may be explained by the learning effect and the complementarities between EI policies. Companies that have adopted other EI programs are more likely to adopt a new program. The greater EI use did not reduce the probability of terminating EI policies. On the contrary, the result in Table 6 shows that the higher Rasch value of EI use is associated with a higher probability of ending an EI program. An explanation for this result is that companies may have adopted the more-than-optimal number of policies. As the result of trial and error, some policies are eliminated.

Second, companies emphasizing market growth are those that are most likely to rely on employees' commitment and innovation, which explains why they are more likely to adopt EI and less likely to end EI use. The appendix table shows the mean and standard deviation of company's emphasis on growth of market shares. In the scale of one to five, the average score is 3.63 and standard deviation is 1.33. The estimate shows

that a one-standard deviation change in the focus on market share is associated with 26-percentage point higher EI adoption rate and 14-percentage point lower rate of abandoning EI. Thus, an emphasis on a product market strategy of growth of market shares has a somewhat larger impact on a company's decision to adopt EI than abandon EI.

Finally, some factors are found to affect the adoption decision but not termination, or vice versa. For instance, Table 6 shows that the strategy of maximizing shareholders' value and management granting autonomy are associated with a lower probability of terminating EI policies. Companies that emphasize employee performance appraisal are more likely to end EI programs. This may be because monitoring employees and motivating them are two methods to reduce employees' shirking and agency problem, and performance evaluation can be regarded as a mechanism to monitor employees, and this is a substitute for EI policies. A greater use of performance evaluation is therefore accompanied by terminating EI. Apart from the above factors, financial incentive programs, specifically gainsharing or group bonus, are positively associated with EI adoption. This result suggests further that companies may have realized the importance of complementarity between EI programs and other human resource policies. As many EI policies are implemented on work groups, group-level financial incentives would make the implementation of EI more robust.

The Level of EI Use and Turnover Rates

Table 7 shows that the greater EI use, as indicated by the larger Rasch value of EI, reduces employee turnover rates. This result supports many previous studies that found reduced turnover rates as being associated with the use of EI policies (Batt, 2002; Batt et al., 2002; Bartel, 2004). In fact, decreasing turnover rates is commonly found as one of the main benefits of utilizing EI in a company. In addition, we also found that average

turnover rate declines with the age of plant. The turnover rate also decreases as companies use more financial incentive plans such as the individual- and firm-level incentive programs. Turnover rates also are lower in companies that target a niche market. The results also show that lower turnover rates are associated with restructuring and management granting greater autonomy.

VI. Summary and Conclusion

Using 10-year longitudinal data of establishments, we show that EI use is not necessarily a stable phenomenon. It has spurts of growth and decline, as do other labor market institutions within firms. We find evidence of symmetry for some explanatory variables included in the analysis, and the evidence is particularly strong for the impact of market growth strategy. However, some factors appear to affect only adoption or termination but not the other, e.g. the degree of current EI use. Although other studies have investigated the determinants of EI adoption, few studies have examined the determinants of the termination of these programs, and even fewer studies have examined the interactions between adoption and termination of EI programs. The lack of a focus on the termination of EI programs may bias upward estimates of the impact of human resources on productivity and other measures of firm performance. Our study develops the relationship between the level of EI and changes in the adoption and termination of these employee voice policies. These results suggest a rethinking of the stability and long-term impact of employee involvement as one of the most often proposed human resource policies by managers, industrial relations specialists, and public policy makers.

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Table 1: Diffusion of EI: Percentage of Establishments Using Multiple Programs

EI programs in use	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
0	23.53	23.53	21.57	21.57	17.65	15.69	11.76	11.76	5.88	3.92
1	21.57	19.61	17.65	17.65	13.73	7.84	9.8	7.84	7.84	3.92
2	9.8	7.84	11.76	13.73	15.69	13.73	13.73	11.76	15.69	17.65
3	13.73	17.65	17.65	19.61	19.61	19.61	17.65	17.65	21.57	21.57
4	9.8	9.8	9.8	7.84	7.84	13.73	19.61	13.73	9.8	13.73
5	1.96	1.96	3.92	3.92	9.8	9.8	9.8	15.69	15.69	15.69
6	11.76	11.76	9.8	9.8	11.76	9.8	7.84	11.76	11.76	11.76
7	3.92	3.92	3.92	1.96	0	5.88	3.92	3.92	5.88	1.96
8	1.96	1.96	1.96	1.96	1.96	1.96	5.88	5.88	5.88	9.8
9	1.96	1.96	1.96	1.96	1.96	1.96	0	0	0	0

Note:

The table shows the percentage of establishments that used zero to nine EI programs in a year. These EI programs include job rotation, joint labor-management committee, suggestion system, TQM, quality circles, self-managed work team, job redesign, quality of work life, and employee representation on the board of directors.

Table 2: The Anatomy of EI Programs: Percentage of establishments that have the combination of programs at the end of the period

	Job rotation (%)	Joint committee (%)	Suggestion system (%)	TQM (%)	Quality of work life (%)	Job redesign (%)	Self-managed work team (%)	Quality circles (%)
Joint committee	51							
Suggestion system	43	39						
TQM	35	35	24					
Quality of work life	35	29	27	22				
Job redesign	33	35	20	24	22			
Self-managed work team	24	22	18	20	22	22		
Quality circles	22	20	22	16	12	8	10	
Employee representation on the board of directors	2	4	2	2	2	0	2	2

Table 3: Number of Establishments Adopting or Terminating Program by Year

Adopting	1986 (left-censored)	1987	1988	1989	1990	1991	1992	1993	1994	1995
Employee Representation on Board of Directors	2				1					
Joint Committee	20				3	3	2	2	3	2
Job Redesign	10			1	2	2	2	2	3	1
Self-Managed Work Team	4			1	3	3	5	3	1	1
TQM	16	1			3	6	1		2	2
Quality Circles	16	2			1	3		1	2	1
Quality of Work Life	14		1		2	2	1	2	2	
Suggestion System	19	1	2	2			3	2	1	3
Job Rotation	23			1	3	5	4	2	2	
Total Number of Adoptions		4	3	5	18	22	18	14	16	10
Terminating	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995 (right-censored)
Employee Representation on Board of Directors						1				
Joint Committee		1	1			1				
Job Redesign			1			1				
Self-Managed Work Team			1			1		3		
TQM			2	2		2	1	1		
Quality Circles	1		3	2	2	4				
Quality of Work Life			2			1	1			
Suggestion System			1			2		2		
Job Rotation						1		1		
Total Number of Terminations	1	1	11	4	2	14	2	8		

Table 4: Number of Years of Individual EI Policy Use Until Termination

	Average	1–3 years (%)	4–5 years (%)	6–8 years (%)
Employee Representation on				
Board of Directors	6			100
Joint Committee	3.7	67		33
Job Redesign	4.5	50		50
Self-Managed Work Team	4.3	33	33	33
TQM	5.0	43	15	42
Quality Circles	4.5	33	33	34
Quality of Work Life	4.3	50	25	25
Suggestion System	6.2	20		80
Job Rotation	4.5	50		50

Table 5: Determinants of Levels of EI Measured By Rasch Value

Dependent Variable: Level of EI (Rasch Value)	
(1)	
Union	-1.084*** (0.174)
Age of plant	-0.476* (0.237)
Restructuring	-0.237** (0.078)
Selection	0.280*** (0.081)
Appraisal	0.198** (0.086)
Training	0.682*** (0.126)
Individual incentive pay	0.302* (0.171)
Gain sharing or group bonus	0.678*** (0.157)
Other firm-level incentive Pay	-0.351 (0.222)
Management granting autonomy	0.531*** (0.098)
Niche market	-0.094 (0.071)
Growth of market share	0.246*** (0.078)
Max. shareholder value	0.074 (0.047)
Short-term profit maximization	-0.065 (0.067)
Previous number of EI programs	-
Constant	-6.466*** (0.825)
Number of observations	179

Note: The level of EI is the Rasch value of EI for each year. Diffusion of EI equals one if the Rasch value of EI increases from the previous year. Decline in EI equals one if the Rasch value of EI decreases from the previous year. Regressions (2) and (3) control for the plant and year fixed effects by including plant and year dummy variables. Standard errors are reported in parentheses. *, **, and *** indicate P<0.1, 0.05, and 0.01.

Table 6: Adoption or Termination of EI as a function of Rasch EI value

	Dependent Variable: Adoption of EI	Dependent Variable: Termination of EI
	0.191***	0.088**
Rasch EI value	(0.064)	(0.041)
Union	-0.341	0.215
	(0.276)	(0.186)
Age of plant	-0.004	0.003
	(0.003)	(0.002)
Restructuring	0.120	-0.035
	(0.123)	(0.129)
Selection	0.071	-0.002
	(0.080)	(0.022)
Appraisal	-0.165	0.097*
	(0.112)	(0.058)
Training	0.092	-0.053
	(0.064)	(0.048)
Individual incentive pay	-0.046	-0.163
	(0.162)	(0.101)
Gain sharing or group bonus	0.438**	-0.005
	(0.171)	(0.121)
Other firm-level incentive Pay	0.192	0.059
	(0.167)	(0.132)
Management granting autonomy	0.074	-0.079*
	(0.082)	(0.047)
Niche market	-0.143	-0.063
	(0.092)	(0.041)
Growth of market share	0.263**	-0.138*
	(0.127)	(0.081)
Max. shareholder value	0.081	-0.045*
	(0.052)	(0.024)
Short-term profit maximization	-0.017	0.132
	(0.114)	(0.085)
Constant	-0.217	0.375
	(0.914)	(0.440)
Number of observations	179	179

Table 7: The Impact of EI on Turnover

	Dependent Variable: Turnover Rate (%)
Rasch EI value	-0.565*
Union	(0.312) 0.341 (0.773)
Age of plant	-0.046*** (0.011)
Restructuring	-3.039*** (0.878))
Selection	1.350*** (0.085)
Appraisal	-0.126 (0.348)
Training	0.985* (0.546)
Individual incentive pay	-1.511** (0.690)
Gain sharing or group bonus	0.636 (0.663)
Other firm-level incentive Pay	-1.689* (0.892)
Management granting autonomy	1.771*** (0.425)
Niche market	-1.224*** (0.286)
Growth of market share	0.567* (0.304)
Max. shareholder value	-0.027 (0.190)
Short-term profit maximization	-0.115 (0.268)
Constant	-5.826 (3.859)
Number of observations	179

Figure 1: Anatomy of EI Programs: Percentage of Companies Using the Following Programs (1995)

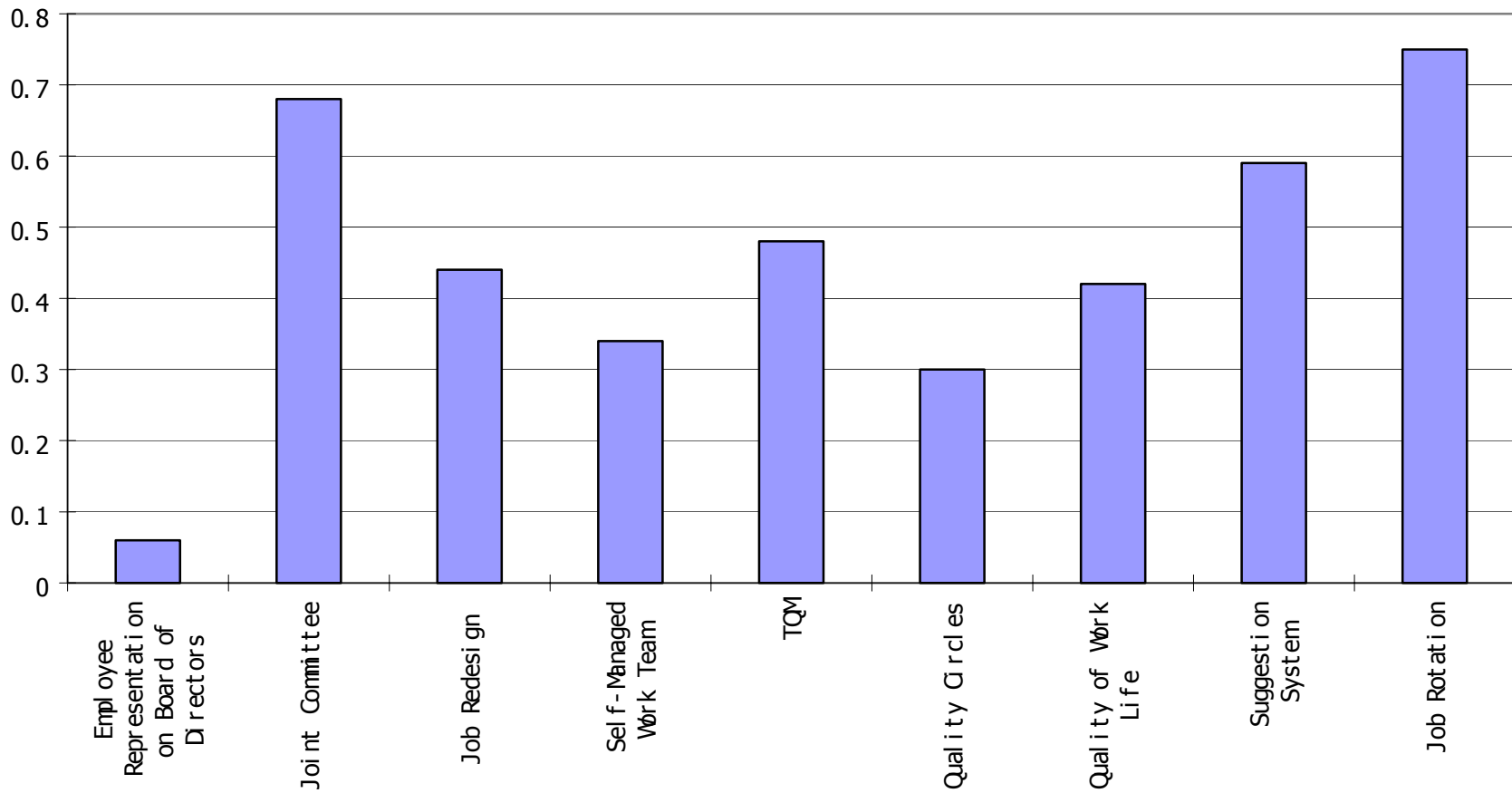
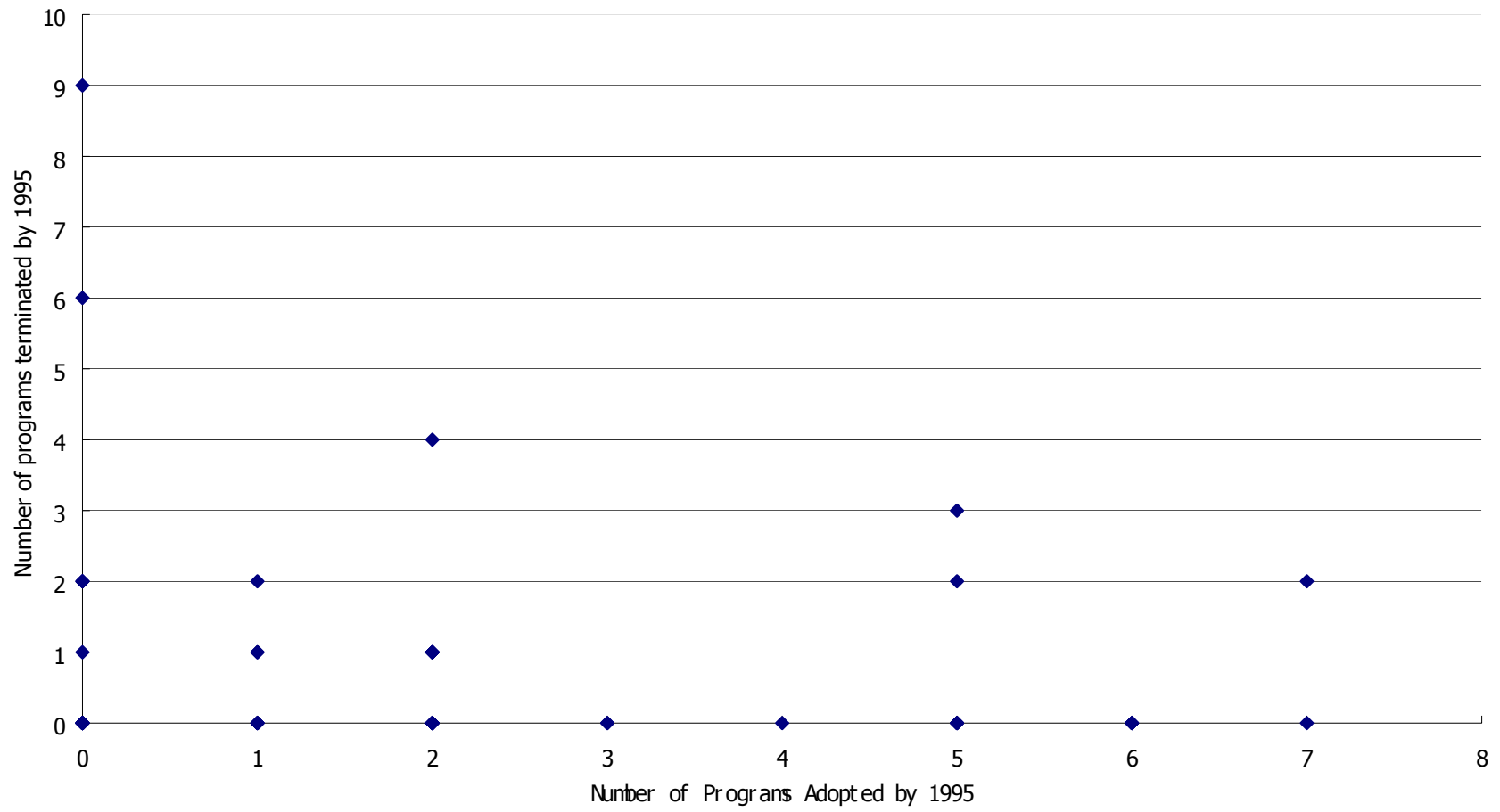


Figure 2: Anatomy of EI Adoptions and Terminations



Appendix Table: Descriptive Statistics of Explanatory Variables

Variable name	Variable Definition	Mean	Standard Deviation
Union	=1 if a plant has a union representation; =0 otherwise;	0.54	
Annual average turnover rate	Average yearly turnover rate	4.49	5.40
Age of plant	Age of plant in years	37.32	29.71
Restructuring	=1 if a plant has recently been restructured; =0 otherwise;	0.17	
Selection	=the total number of selection programs used in a plant including a detailed screening process, personal interview, aptitude test, physical exam, reference check, and probationary period; takes a value from 0-6;	4.88	1.23
Appraisal	=the total number of performance appraisal programs used in a plant including assessment centers, formal review sessions, and a standardized evaluation form; takes a value from 0-3;	1.52	0.92
Training	=the total number of training programs used in a plant including on-the-job training, team building training, on-site training, and tuition reimbursement; takes a value from 0-4;	3.36	0.65
Ind. incentive pay	=1 if a plant has adopted the individual incentive pay plan; =0 otherwise;	0.55	
Gain sharing or group bonus	=1 if a plant has adopted a gainsharing plan or group bonus program; =0 otherwise;	0.40	
Other firm-level incentive Pay	=1 if a plant has adopted an ESOP, cash or deferred profit sharing, or employee stock purchase plan; =0 otherwise.	0.74	
Management granting autonomy	The degree of manager giving employees autonomy in the scale of 1-5;	3.51	0.93
Niche market	The degree of a plant's focusing on niche market in the scale of 1-5;	3.20	1.38
Growth of market share	The degree of a plant's focusing on growth of market shares in the scale of 1-5;	3.63	1.33
Maximizing shareholder value	The degree of a plant's focusing on maximizing shareholder value in the scale of 1-5;	3.67	1.57
Short-term profit maximization	The degree of a plant's focusing on short-term profit maximization in the scale of 1-5;	3.51	1.14
EI	Previous number of EI programs adopted	3.65	2.07