Skills Research Initiative
Initiative de recherche sur les compétences

Firm Provision of Training:
Establishment Level Analysis

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Working Paper 2006 B-12

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Abstract

Human capital formation through training is acknowledged widely as a major factor underpinning worker and firm productivity. The shift in Canada in favour of knowledge-based industries requires an adequate supply of trained workers with the required levels and types of skills. Employer-based formal and informal training is a major source of supply of skills.

Our analysis builds upon previous work in three ways. First, we estimate the classroom and on-the-job training decisions as being correlated and simultaneously made, whereas previous analyses tend to estimate these training outcomes separately. Second, we estimate the training expenditure equation taking into account the bivariate selection mechanism. Finally, we specifically examine the effect of collective agreement clauses and work organization practices, in addition to the variables controlled for in previous studies.

We estimate our model using data from the Workplace and Employee Survey (WES). WES is a longitudinal, matched employer-employee survey that has information on the number of employees receiving training, the type of training provided, training expenditures and the characteristics of employers and employees.

We find that not distinguishing between the classroom training decision and the on-the-job training decision masks important differences between the decisions. Consistent with earlier results, we find that larger firm size increases the likelihood that an establishment offers classroom or on-the-job training. However, we also find that larger establishments spend less per employee when offering only classroom training and when offering both classroom and on-the-job training. Establishments in a number of service sector industries notably business services, finance/insurance and communications/utilities have a higher likelihood of offering both classroom and on-the-job training and a lower likelihood of not offering any training; this is also the case for establishments in the construction industry. Other factors found to affect the provision of training include the occupational composition of the firm's workforce (a greater representation of professional and technical occupations increases the likelihood of training), process and product innovation (more innovative firms are more likely to train), employee turnover (higher turnover increases the probability of providing training), market characteristics, and firm-level factors including clauses in collective agreements, alternative forms of work organization and the presence of labour-management committees.

Résumé

Il est largement reconnu que l'acquisition de capital humain par la formation est un facteur important à l'origine de la productivité des travailleurs et des entreprises. Au Canada, l'orientation en faveur des industries axées sur le savoir exige une offre suffisante de travailleurs qualifiés possédant les niveaux et les types de compétences recherchés. La formation structurée et non structurée offerte par l'employeur participe de façon importante à l'offre de main-d'œuvre qualifiée.

Pour notre analyse, nous nous sommes inspirés de précédentes études de trois façons. Premièrement, nous avons estimé que les décisions liées à la formation en classe et à la formation en milieu de travail sont corrélées et prises simultanément, alors qu'autrefois, ces décisions étaient analysées séparément. Deuxièmement, nous avons estimé l'équation des dépenses en formation en tenant compte du mécanisme de sélection à deux variables. Enfin, nous avons examiné en particulier l'incidence des dispositions des conventions collectives et des pratiques en matière d'organisation du travail ainsi que des variables dont ont déjà tenu compte de précédentes études.

Nous avons estimé notre modèle en nous servant des données de l'Enquête sur le lieu de travail et les employés (ELTE). Il s'agit d'une enquête longitudinale qui lie les employeurs et les employés au niveau des données et qui contient des renseignements sur le nombre d'employés qui reçoivent de la formation, le type de formation offerte, les dépenses en formation et les caractéristiques des employeurs et des employés.

Nous avons constaté que l'absence de distinction entre les décisions relatives à la formation en classe et les décisions relatives à la formation en milieu de travail cache d'importantes différences entre ces deux types de décisions. Nous avons constaté, à l'instar de résultats antérieurs, que les grandes entreprises sont plus susceptibles d'offrir de la formation en classe ou de la formation en milieu de travail. Toutefois, nous avons aussi observé que les grandes entreprises dépensent moins par employé lorsqu'elles offrent une formation en classe seulement et une formation en classe et en milieu de travail. Les établissements d'un certain nombre d'industries de services, notamment les services aux entreprises, la finance et les assurances ainsi que les communications et les services publics sont plus susceptibles d'offrir de la formation en classe et de la formation en milieu de travail et moins susceptibles de n'offrir aucune formation. C'est aussi le cas des établissements de l'industrie de la construction. Parmi les autres facteurs qui influent sur la prestation de la formation, notons la composition professionnelle de la main-d'œuvre de l'entreprise (une plus grande représentation d'emplois professionnels ou techniques augmente la probabilité de la formation), l'innovation dans les procédés et les produits (les entreprises plus novatrices sont plus susceptibles d'offrir de la formation), le taux de roulement du personnel (un taux plus élevé augmente la probabilité de la formation), les caractéristiques du marché et les facteurs propres à l'entreprise, notamment les dispositions des conventions collectives, d'autres formes d'organisation du travail et la présence de comités patronal-syndical.

1. Introduction

Human capital formation, through training, is acknowledged widely as a major factor underpinning worker and firm productivity.[1] The shift in Canada in favour of knowledge-based industries requires an adequate supply of trained workers with the required levels and types of skills. Employer-based formal and informal training is a major source or supply of skills.

Training activity varies with a number of factors, notably firm size; in particular, empirical evidence regarding training and firm size suggests that training activity generally increases with firm size (Chaykowski and Slotsve 2003). As well, training incidence has been observed to increase with firm size (e.g.,Hum and Simpson 2001; Betcherman et al 1998; 1996; Baldwin and Johnson 1995); and the likelihood of employers sponsoring training programs increases with firm size (Turcotte, Léonard, and Montmrquette 2003; Kapsalis 1996); and the duration of training also increases with firm size (Hum and Simpson 2001; Jennings 1996). These empirical regularities are important in view of the combined relative shifts in the Canadian economy over time in favour of smaller firms and in industrial composition toward services (Baldwin et al 2002) – because the increase in the number of firms with these characteristics may result in lower aggregate levels of employer-based training activity.

Our analysis extends previous work on the determinants of training outcomes in several ways. Previous research has examined alternative training activities as separate outcomes. We extend this approach by estimating the classroom and on-the-job training decisions as being correlated and simultaneously made. Second, while we also examine training expenditures, we extend preceding work by estimating the training expenditure equation taking into account the bivariate selection decision.

Finally, in addition to the variables typically controlled for in previous studies, we specifically examine the effect of institutional arrangements, including collective agreement clauses and work organization practices, on training outcomes. This paper explicitly extends the analysis of Chaykowski and Slotsve (2005) that focuses on industry and firm size as determinants of variation in the incidence and intensity of training across establishments, by investigating the importance of institutional arrangements as determinants of the incidence and intensity of training activity.

Following Chaykowksi and Slotsve (2005), we view the objective of firm-sponsored training as being to provide employees with the types and levels of skills that will enable workers to efficiently perform their jobs. We model the establishment decision as one in which the employer has a range of possible choices about the particular combination (or package) of classroom and on-the-job training to provide to workers. The optimal training package is the one chosen by the firm that is associated with profit maximization.

[1] See Becker (1975) on training and education and earnings and Courchene (2001) on developing human capital as a broader national productivity strategy.

There are several ways in which the firm can view the choice decision regarding the combination of classroom and on-the-job training.

Generally, if the firm views classroom and on-the-job training as interchangeable choices then the employer faces the simple decision of whether or not to train workers: the two outcomes in this case are either to train or not train. On the other hand, the firm may view classroom and on-the-job training as distinct choices, in which cases there exists four possible training outcomes. These outcomes include that: neither classroom nor on-the-job training are provided; classroom training provided and on-the-job training not provided; classroom training not provided and on-the-job training provided; and classroom and on-the-job are both provided.

Since the two ways of imparting skills are not perfect substitutes for each other, we characterize the firm decision to provide either classroom or on-the-job training as separate decisions. However, in some cases, for some types of skills, the two methods of delivery may be complementary to each other. As examples, health and safety training, or technical training in operating some types of equipment, may best be delivered through a combination of classroom training (that covers technical and other information) as well as on-the-job training, which develops learning about implementation. We model the firm as simultaneously deciding whether or not to provide classroom and on-the-job training.

In order to empirically implement the theoretical model, we estimate a model of the employer sponsored training decision in which the employer views the provision of classroom and on-the-job training as decisions that are correlated but simultaneous. We estimate both a model of incidence, as a bivariate probit model with correlation, and an intensity model, as a bivariate selection model with correlation between decision equations. Intensity is measured as the log of training expenditures per employee.

We expect a number of key firm attributes to determine the amount and type of training conducted. These factors include occupation, firm size, the nature of the production process (captured by industry, product or process innovation), turnover, market conditions (e.g., degree of competition; scale of competition), institutional factors (e.g., the proportion of the establishment covered by a collective agreement; the degree of wage compression at the firm; the types of human resource practices utilized) and work arrangements (e.g., proportion of the workforce employed full-time versus part-time). One key set of explanatory variables are those relating to work organization characteristics, which we expect to have an effect on both the incidence and intensity of training.

The analysis begins in the following section with a model of firms' training decisions. We characterize the firm is viewed as having a range of possible choices or decisions regarding the combination of classroom and on-the-job training to provide. The firm problem is to choose an optimal training package, which is the one associated with profit maximization. The model is used as a basis for the subsequent empirical analysis.

The third section of the paper presents the data and empirical methodology used in the analysis. The analysis makes use of the Workplace and Employee Survey (WES), which is a matched employer-employee survey that has the required information about the number of employees receiving training, the type of training provided, and characteristics of employers and employees. The fourth section provides the main empirical findings, including a discussion of the results of the regression analysis. Conclusions and implications follow in the final section.

2. Model of the Firm's Training Decision

The firm is viewed as approaching training from a strategic perspective in which it chooses a training strategy subject to various constraints. In practice, at any given firm or establishment, the employer must choose some combination of classroom and on-the-job training in order to achieve their desired overall level of employer-provided training. The training strategy therefore consists of choosing an optimal amount and "package" of training that best corresponds to their needs. We define the training package as a combination of some set of underlying training "methods" (some combination of classroom versus on-the-job training). Thus the key issue in examining the provision of employer sponsored training is the firm's choice of how to actually deliver training; the choice set essentially consists of two broad methods of training, including classroom and on-the-job.[2]

The goal of firm-sponsored training is to provide its workforce with the appropriate skill set to enable workers to efficiently perform their jobs. The training provided by the firm will depend upon the specific tasks an employee needs to perform, the skills the employee already has, and whether certain training is government mandated. At its most elemental level the training provided to a worker is tailored to workers' needs and job requirements. The worker may need some combination of basic (orientation, literacy and numeracy), organizational (group decision-making or problem solving, teambuilding, leadership, communication, occupational health & safety, environmental protection), occupational (management/supervisory, professional, apprenticeship, sales and marketing) or technical (computer hardware, computer software, other office and non-office equipment.) training. The optimal delivery mode (on-the-job or classroom training) for providing each specific training component must also be determined.

For example, a worker's supervisor may be responsible for deciding which training a worker requires and how the training is to be provided (on-the-job, classroom or both). The specific contents of a training segment may be determined as a result of a firm's business strategy; alternatively, it may be determined by government mandate. In the former case, the supervisor or a human resource unit may determine the training requirements arising from company policy or in relation to the firm's decision to employ a new technology or produce a new product or service, as examples. In the latter case, training may be required by government legislation as a matter of health and safety, workers' compensation, required operating procedures, or workplace equity. In all these cases, though, the firm's management or human resource unit coordinates training activities across employees.

Thus the provision of employer-sponsored training is a complex problem. All these decisions need to be coordinated so that they are consistent with the firms' bottom line – profit maximization. A key issue for examining the provision of employer-sponsored training is: how does the firm determine the appropriate delivery mode for training?

[2] Each mode or method of training could be used to deliver different types of training (e.g., technical skills; safety skills; management skills, etc.)

The first question is whether the firm views the provision of classroom training as a separate decision from the provision of on-the-job training? If the firm does not view classroom and on-the-job training as distinct choices then there exist two outcomes: "train" or "do not train." On the other hand, if the firm views classroom and on-the-job training as distinct then there exist four outcomes including:

- neither classroom nor on-the-job training are provided;
- classroom training provided and on-the-job training not provided;
- classroom training not provided and on-the-job training provided; and
- classroom and on-the-job are both provided.

We model the firm provision of classroom and on-the-job training as separate decisions because the two modes of delivery are not perfect substitutes for each other. Furthermore, at least for some types of training, the two modes of delivery may be complementary. For example, some technical training in operating equipment, or performing a trade, may best be delivered through a combination of classroom training (that covers technical and other information) as well as on-the-job training, which is better suited to learning about implementation.

If the firm does not view the provision of classroom and on-the-job training as two distinct decisions, then the decision process can be modeled as a single equation given by:

$$I_{0i}^{*} = z_{0i}\alpha_{0}^{*} + \varepsilon_{0i}^{*}$$

where I_{0i}^{*} is the underlying latent training index of firm i. The firms' decision is then one of choosing between two mutually exclusive alternatives ("provide training" or "do not provide training"). In this case, the firm makes one choice between the two alternatives. The error term is assumed to be normally distributed with mean zero and variance σ^2. To estimate the equation we define a dichotomous variable I_{0i} that indicates which of the two alternatives is chosen. That is, we define $I_{0i} = 1$ if and only if $I_{0i}^{*} \geq 0$ (training is provided) and $I_{0i} = 0$ if and only if $I_{0i}^{*} < 0$ (training is not provided). This equation can be estimated by the use of univariate probit methods.

Given classroom and on-the-job training are viewed as involving distinct decisions, then the second question concerns the firm's decision process in determining which of the four outcomes to choose. One possibility is that the firm makes a decision to provide only one combination of training among the set of four alternatives. The other possibility is that the firm simultaneously decides whether or not to provide classroom and on-the-job training. In this case, the firm would make two decisions rather than one: the first decision is whether or not to offer classroom training; the second is whether or not to offer on-the-job training – where these decisions are made simultaneously.[3] The choice of

[3] That is, we clearly want to distinguish this from a sequential decision-making process.

modeling approach depends upon the level of analysis; that is, whether or not one is examining a specific training program versus considering training activity at a more aggregate level (i.e., across training programs at the firm).

When examining training outcomes at an aggregated level at the firm, the aggregate training measures arise as a result of many specific underlying training decisions that occur in different contexts within the firm. When training data is aggregated, it is not obvious that a single training delivery mode applies to all types of underlying training activity. The case in which the firm simultaneously decides whether or not to provide classroom and on-the-job training, is more appropriate and more parsimonious. Since our data is aggregated across particular training categories, we model the firm as simultaneously making two decisions: that is, simultaneously deciding whether or not to provide classroom and on-the-job training.

The decision process in the two equation system is given by[4]:

$$I_{1i}^{*} = z_{1i}\alpha_{1}^{*} + \varepsilon_{1i}^{*}$$

$$I_{2i}^{*} = z_{2i}\alpha_{2}^{*} + \varepsilon_{2i}^{*}$$

where I_{1i}^{*} and I_{2i}^{*} are the underlying latent classroom and on-the-job training indexes of firm i respectively. z_{ji} is a vector of explanatory variables and α_{j}^{*} a parameter vector for each equation.

The latent variables I_{1i}^{*} and I_{2i}^{*} denote firm i's net benefits from providing classroom or on-the-job training. The net benefits I_{ji}^{*} are not observed, however, we do observe the firm's training decisions. Consequently, to estimate the equations we define a dichotomous variable I_{ji} that indicates which alternative is chosen in each decision equation. That is, define $I_{ji} = 1$ if and only if $I_{ji}^{*} \geq 0$ and $I_{ji} = 0$ if and only if $I_{ji}^{*} < 0$ for each decision. The error terms are assumed to be normally distributed with mean zero and variance-covariance matrix Σ^{*} where ε_{1i}^{*} and ε_{2i}^{*} may or may not be correlated. If ε_{1i}^{*} and ε_{2i}^{*} are assumed to be independent then the two equation system can be estimated by estimating each equation separately (univariate probit). On the other hand, if ε_{1i}^{*} and ε_{2i}^{*} are assumed to be correlated (ρ) then the two equations need to be estimated simultaneously (bivariate probit).

The above model is useful for examining the determinants of the *incidence* of employer provided training. A natural extension is to also examine the determinants of the *intensity* of employer provided training as measured by the log of training expenditures per employee, $\ln(e_i)$. The approach to incorporating the expenditure decision depends upon

[4] See Technical Appendix I of Chaykowski and Slotsve (2005) for further details.

the level of aggregation in the data. If we could examine very specific training decisions, then an appropriate modeling approach would be to define a general choice framework based on Train (2003) and McFadden and Train (2000).[5] Unfortunately, we do not have access to the appropriate data to use this approach. In particular, we do not observe the unit cost of training for training alternatives *not* chosen by the firm.

Given the aggregated nature of the data, we consider a bivariate selection model to be more appropriate.[6] Firm i's training expenditure equation is given by:

$$\ln(e_i) = x_i\beta_i + u_i$$

where x_i is a vector of explanatory variables, β_i is a parameter vector, and u_i is a error term with mean zero and variance σ_u^2. The conditional expected training expenditure function is:

a) $E(\ln(e_i \mid I_{1i}^* < 0, I_{2i}^* < 0)) = x_i\beta_i + E(\varepsilon_{1i}^* < -z_{1i}\alpha_1^*, \varepsilon_{2i}^* < -z_{2i}\alpha_2^*)$ when the firm provides neither classroom nor on-the-job training ($I_{1i} = 0$ and $I_{2i} = 0$). In this case $\ln(e_i)$ equals zero.

b) $E(\ln(e_i \mid I_{1i}^* \geq 0, I_{2i}^* < 0)) = x_i\beta_i + E(\varepsilon_{1i}^* \geq -z_{1i}\alpha_1^*, \varepsilon_{2i}^* < -z_{2i}\alpha_2^*)$ when the firm only provides classroom training ($I_{1i} = 1$ and $I_{2i} = 0$). In this case $\ln(e_i)$ equals the log of classroom training expenditures per employee.

c) $E(\ln(e_i \mid I_{1i}^* < 0, I_{2i}^* \geq 0)) = x_i\beta_i + E(\varepsilon_{1i}^* < -z_{1i}\alpha_1^*, \varepsilon_{2i}^* \geq -z_{2i}\alpha_2^*)$ when the firm only provides on-the-job training ($I_{1i} = 0$ and $I_{2i} = 1$). In this case $\ln(e_i)$ equals the log of on-the-job training expenditures per employee.

d) $E(\ln(e_i \mid I_{1i}^* \geq 0, I_{2i}^* \geq 0)) = x_i\beta_i + E(\varepsilon_{1i}^* \geq -z_{1i}\alpha_1^*, \varepsilon_{2i}^* \geq -z_{2i}\alpha_2^*)$ when the firm provides both classroom and on-the-job training ($I_{1i} = 1$ and $I_{2i} = 1$). In this case $\ln(e_i)$ equals the log of classroom plus on-the-job training expenditures per employee.

The bivariate selection equations and the training expenditure equation can be estimated by a two-step procedure or by FIML.[7]

The firm is viewed as choosing an "aggregate training package" that best corresponds to their overall training strategy and maximizes profits. That is, we think of the firm as choosing the profit maximizing alternative from the set of all possible delivery mode and expenditure combinations for training. In any given firm or establishment, however, the

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[5] See Technical Appendix II of Chaykowski and Slotsve (2005) for details.

[6] An alternative approach, used by Frazis et al (2000), is a two-part model. See Technical Appendix I of Chaykowski and Slotsve (2005) for details.

[7] Refer to Technical Appendix I of Chaykowski and Slotsve (2005) for details on each method.

employer decision to provide training may be influenced by a variety of different factors and firm characteristics. In the next section we describe the data, outline our estimation strategy and address several specification issues.

3. The Empirical Approach

3.1 Estimation Sample

The analysis makes use of the Workplace and Employee Survey (WES). The WES is an establishment level matched employer-employee survey that includes information about the number of employees receiving training, the type of training provided (e.g., classroom versus on-the-job training), and expenditures on training. The survey includes extensive information about the characteristics of employers and employees. The WES also contains information on establishment size and industry, which are two of the key characteristics examined in the analysis.

The empirical analysis uses WES for the year 2002; we also provide some summary descriptive results for 1999 – 2002 in order to provide context for our results. We exclude not-for-profit firms and firms that have not completed a fiscal year from our sample.[8] The number of observations in the usable sample was roughly 4118 in 2002. Survey data on a number of WES variables was only collected in 1999 and 2001.[9] For these variables the missing 2002 data was set equal to the variables' 2001 value.

[8] Following Statistics Canada recommendations, all reported standard errors have been bootstrapped.

[9] These variables include: CBA clauses (technological provisions, reorganization provisions, participation provisions, health & safety provisions, and education training provisions); human resource unit; locus of competition (local, Canada, USA, rest-of-the-world, none); number of competing firms (0, 1-5, 6-20, 20+); work organization (flexible job design, problem solving teams, labour-management committees, self-directed work groups); number of business strategies (R&D, organizational, cost control); and relative and absolute 2060 earnings.

3.2 Estimation Approach: Models of the Training Outcomes

In order to empirically implement the theoretical model, we estimate three models of the employer sponsored training decision. These three models reflect whether or not the employer views the provision of classroom and on-the-job training as: distinct (M1); as decisions that are uncorrelated but simultaneous (M2); or, as decisions that are correlated but simultaneous (M3). These three models include:

M1 Single Equation Probit Model (Incidence Model)
Univariate Selection Model (Intensity Model)

In this basic model, the firm does not view classroom and on-the-job training as distinct, so there exist two outcomes: "train" and "do not train." Consequently, the dependent variable takes on a value of 1 if the firm provides any training (where no distinction is made between classroom and on-the-job training) and a value of 0 otherwise.

M2 Bivariate Probit Model with Zero Correlation (Incidence Model)
Bivariate Selection Model with Zero Correlation between Decision Equations (Intensity Model)

In this model, the firm considers the provision of classroom and on-the-job training as distinct but uncorrelated decisions that are made simultaneously. Consequently, the dependent variable for classroom (on-the-job) training assumes a value of 1 if the firm provides classroom (on-the-job) training and a value of 0 otherwise. Since the decisions are not correlated, two separate probit equations are estimated: one for the classroom training decision and another for the on-the-job training decision.

M3 Bivariate Probit Model with Correlation (Incidence Model)
Bivariate Selection Model with Correlation between Decision Equations (Intensity Model)

In this full model, the firm views the provision of classroom and on-the-job training as distinct but correlated decisions that are simultaneously made. As in the uncorrelated model, the dependent variable for classroom (on-the-job) training takes on a value of 1 if the firm provides classroom (on-the-job) training and a value of 0 otherwise. Since the decisions are correlated, and the same explanatory variables are included in both equations, the model is estimated as a bivariate seemingly unrelated (SUR) probit.

Corresponding to each incidence model, there is a training intensity model with selection, where the dependent variable is measured by the log of training expenditures per employee, $\ln(e_i)$.We discuss the results of model M3 in the body of the paper.

3.3 Specification of the Dependent and Explanatory Variables

In this section we present the dependent and explanatory variables used in the analysis. The section also includes a discussion of several estimation issues. Complete variable definitions are presented in Table 1. Means of the key variables are presented in Table 2, for each of the sample years 1999 through 2002.

Dependent Variables

The dependent variable for the classroom (on-the-job) training decision equation takes a value of one if the establishment provides any classroom (on-the-job) training and takes a value of zero otherwise. WES contains separate information for classroom and on-the-job training for the following training activities:

1) *basic* training including orientation, literacy and numeracy
2) *occupational* training including management/supervisory training, professional training, apprenticeship training, sales and marketing training
3) *organizational* training including group decision-making or problem solving, teambuilding, leadership, communication, occupational health & safety, environmental protection
4) *technica*l training including computer hardware, computer software, other office and non-office equipment.

We define four additional training variables to capture whether or not classroom (on-the-job) training occurred in the areas of basic training, occupational training, organizational training, and technical training, respectively. These variables are in the descriptive Tables 3 and 4.

The intensity of training is measured as the natural logarithm of training expenditures per employee. The WES *workplace* data has information on the total classroom training expenditure at the establishment. However, because the workplace data does not have information on the total on-the-job training expenditure we had to construct a measure using the *employee* data. The WES employee data has information on how many hours of on-the-job training the worker received and their usual hourly wage.

If we had training data on each worker within an establishment, then the total on-the-job training (wage) expenditure would be the sum across all workers of the number of on-the-job training hours the employee received multiplied by the employee's usual hourly wage.[10] Unfortunately we only have a sample of workers at the firm. Therefore we calculate the total on-the-job training (wage) expenditure as:

1. for each worker in the sample receiving on-the-job training, we multiple the number of on-the-job training hours the employee received by the employee's usual hourly wage

[10] For simplicity, we ignore direct training costs arising from the use of training materials, etc.

2. for each establishment, we calculate the average of step (1) among workers receiving training
3. we multiply the calculation in step (2) by the number of workers receiving on the on-the-training at the establishment (available in the WES *workplace* data).

Although our measure of total on-the-job training (wage) expenditure is an estimate, it is expected to capture the major component of on-the-job training costs – wages costs.

The natural logarithm of training expenditures per employee then equals the natural logarithm of the sum of total classroom and on-the-job training expenditures divided by the number of employees at the establishment. We use the measure "training expenditure per employee" rather than "per trained employee" because the number of trained employees is already a function of the management's training decision. In other words, equal training expenditures per trained employee can imply either the same or very different training intensity across firms.

Explanatory Variables

Firm attributes that we expect to determine the amount and type of training include firm size, the nature of the "final output" production process (captured by industry and the distribution of occupations within the firm), product or process innovation, turnover, market conditions (such as the degree of competition and the regional scope of competition), the scale of competition (number of competing firms), institutional constraints (such as the proportion of the establishment covered by a collective bargaining agreement, collective bargaining clauses with respect to training, and human resource management practices), firm characteristics (foreign ownership, proportion of the workforce employed full-time and whether the establishment is part of a multi-establishment firm), and region. We consider these correlates below.

Establishment size: Bishop (1997) has argued that larger firms can take advantage of "economies of scale" in training. Oi and Idson (1999) note that the amount of training provided to workers increases with firm size. Lynch and Black (1998) find that the incidence and intensity of employer provided training rises with firm size[11].

Industry and Occupation: We expect the nature of the production process, as captured by industry and the distribution of occupations within the firm, to affect the incidence and intensity of training. Lynch and Black (1998) find the incidence of formal training is higher in the non-manufacturing sector. Tuijnman and Boudard (2001) find that the mean number of hours of education and training per employee is higher for blue-collar workers than for white-collar workers. The analysis includes 14 separate industries. The occupations included in the analysis include managers, professional, sales, administrative, technical, and production.

[11] Chaykowski and Slotsve (2003) review the evidence on the relationship between firm size and employer-sponsored training.

Innovation: Firms invest in new technologies (substitute capital for labour) in order to lower costs of production, increase productivity, and thereby compete more effectively. We include separate controls for process[12] and product[13] innovation since they capture different aspects of technological change.

Turnover: The firm's ability to recoup investments in training is a function of turnover. Consequently, we expect turnover to be negatively associated with the incidence and intensity of training. On the other hand, as Frazis et al. (2000) and Black and Lynch (1998) point out, firms with higher turnover have workers with relatively lower tenure where the benefits of training are expected to be greater. In the past two decades, firms' have also reorganized (streamlined) their production processes to reduce the number of employees on the payroll thereby lowering labour costs. We control for whether the firm has downsized[14] because downsizing may entail training employees in their new job responsibilities.

Competition: We expect the scale and degree of competition to influence firm investments in training. We capture the scale of competition by controlling for the number of competitors the establishment faces. We also expect the regional source (local, Canada, USA, rest-of-the-world) to affect training investments. We use the proportion of market sales as the control in the decision equation and the source of competition as the control in the expenditure equation[15].

Institutional: We also control for a number of important institutional factors that are expected to affect training outcomes. These include the proportion of the establishment covered by a collective agreement, whether the collective agreement contains clauses expected to affect training (technological provisions, reorganization provisions, participation provisions, health and safety provisions, education training provisions), whether or not the establishment has a human resource unit, and whether or not the establishment utilizes various innovative human resource and management work organization practices[16] (flexible job design,[17] problem solving teams,[18] labour-management committees,[19]self-directed work groups[20]). Frazis et al. (2000, 448) argue

[12] Improved processes are those whose performance has been significantly enhanced or upgraded. New processes include the adoption of new methods of goods production or service delivery.
[13] Improved products or services are those whose performance has been significantly enhanced or upgraded. New products or services differ significantly in character or intended use from previously produced goods or services.
[14] The WES workplace survey defined downsizing as a reorganization in the workplace and not simply a response to drop in demand.
[15] That is, we use the two measures of the regional source of competition as the identifying restriction for the selection model analysis.
[16] Work organization practices are only defined for establishments of size 10+ in WES.
[17] Including job rotation, job enrichment/redesign (broadened job definitions), job enrichment (increased skills, variety or autonomy of work).
[18] Responsibilities of teams are limited to specific areas such as quality or work flow (i.e. narrower range of responsibilities than Self-directed work groups).
[19] Non-legislated joint labour-management committees and task teams that generally cover a broad range of issues, yet tend to be consultative in nature.

that these work organization practices discourage turnover and increase job security "in exchange for an increased commitment to the workplace that is considered essential for these practices to improve firm performance."

Firm Characteristics: We expected firm characteristics, such as the percentage of firm assets held by a foreign interest, the proportion of the workforce that is employed full-time, whether the establishment is part of a larger (multi-establishment) firm, and the degree of earnings compression at the establishment, to potentially affect training decisions. Whether the establishment is part of a larger (multi-establishment) firm may have an impact on the training offered since larger (multi-establishment) firms are more likely to have a human resource unit, in-house or otherwise to coordinate training activities. As a result they are more likely to have economies of scale in the provision of training.

There is some evidence that the greater the degree of wage compression in the firm, the more training activity takes place (Acemoglu and Pischke 1999; Almeida-Santos and Mumford 2004). In order to account for this effect, we constructed a variable to measure whether the establishment has a higher proportion of workers in the middle earnings range, relative to the industry in which the establishment operates (a relative 20-60 earnings variable). This variable is intended to capture the degree of earnings compression in the establishment relative to the industry as a whole.

Except for the 2060 earnings variables, the definition of the other variables used in our analysis is straightforward. The relative 2060 earnings variable is defined as the proportion of the establishment's workforce earning between $20,000 and $60,000 *divided* by the proportion of workers in the establishments industry earning between $20,000 and $60,000. The 2060 earnings variables were constructed using the WES *workplace* data to capture an establishment's earnings compression relative to the industry of the establishment.

Business Strategy: Many of the above controls can be thought of as forming part of the establishments' overall business strategy. Consequently, we also control for the number of R&D,[21] the number of organizational,[22] and the number of cost control[23] business strategies employed by the establishment.
The number of business strategies pursued by an establishment is used as a measure of how aggressively the establishment is pursuing its goals.

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[20] Semi-autonomous work groups or mini-enterprise work groups that have a high level of responsibility for a wide range of decisions/issues.
[21] Including undertaking R&D, developing new products/services, developing new production/operating techniques, expanding in new geographic markets, and improving product/service quality.
[22] Including total quality management, using more part-time, temporary or contract, reorganizing the work process, enhancing labour-management cooperation, increasing employee's skills, and increasing employee involvement.
[23] Including reducing labour costs, reducing other operating costs, improving coordination with customer/supplier, and improving measures of performance.

Other Variables: We also control for region and employ a two factor model by including time and establishment dummy variables[24].

Specification of the Equations

One potentially important set of explanatory variables available in the WES captures various types of work organization, including Flexible Job Design, Problem Solving Teams, Labour-Management Committees, and Self-Directed Work Groups (refer to Table 1). Black and Lynch (2002) find, for example, that new methods of training, and training associated with work organization are positively associated with firm size. These work organization variables are, however, only available in the WES for firms of size 10 or more employees.

We therefore estimate two specifications of the three different empirical models, based upon the in(ex)clusion of the work organization characteristics of the firm. The first specification (Specification 1) does not control for the work organization characteristics of the establishment and so the usable sample includes all establishments in the sample. We also estimate the three models controlling for work organization practices of the establishment (Specification 2); consequently, for this analysis, the sample is necessarily restricted to establishments of size 10 employees or more.

One issue arises in firm-level analysis that incorporates worker characteristics on the right-hand side (i.e., average age, education, and experience of employees at a given establishment). The use of an "average" can mask significant variations across workers because what may matter may not be the average, but the margin. Another approach would be to conduct worker-level analysis incorporating firm characteristics, as these do not vary across workers at an establishment. Given the issues we examine in this paper, however, the appropriate unit of analysis is at the firm level. Consequently, we do not control for average worker characteristics and instead focus on firm-level factors.

[24] See Technical Appendix I for further details.

3.4 Calculation of Marginal Effects

Since the probit and bivariate probit models are nonlinearly specified, we calculate the marginal effects to ease the interpretation of the results. [25]There are, however, two ways to calculate the marginal effects for discrete explanatory variables:

1) The marginal effect can be calculated as the difference in the probability when evaluated at x = 1 and when evaluated at x = 0. That is, the marginal effect is the difference in the predicted probability if all firms were non-unionized (x=0) versus all firms being unionized (x=1). In this approach two hypothetical economies (100% unionized versus 100% non-unionized) are being compared[26].
2) The marginal effect can be calculated as the difference in the probability when evaluated at x=1 (or x=0) and the predicted probability obtained by evaluation at the establishment's actual value of x. In this case, there are two marginal effects:

    a) the difference in the predicted probability if all firms were nonunionized (x=0) versus the firm's actual union status, and
    b) the difference in the predicted probability if all firms were unionized (x=1) versus the firm's actual union status.

    In this approach, a hypothetical economy (say all firms were unionized) is compared to the actual economy. Thus, the marginal effect (a) is the change in a probability induced by union firms being treated as if they were nonunion firms, all else equal. The marginal effect (b) is the change in a probability induced by nonunion firms being treated as if they were union firms, all else equal. In this approach a hypothetical economy is compared to the actual economy.

The difference in the two approaches is the appropriate reference category for the comparison. In the context of policy analysis we believe the appropriate reference category is based on the firm's actual characteristics rather than another hypothetical economy where all firms are, say, unionized. The second approach can also be viewed as a generalization of the first approach. Specifically, the sum of the absolute value of the two calculations in the second method equals the absolute value of the calculation in the first method.

We report marginal effects using the second approach. In our analysis, the marginal effects were calculated for every observation and the sample average of the individual effects is reported.[27] Marginal effects are calculated for the marginal, conditional, and

[25] The marginal effect (Greene, 2003 p. 668) is given by the change in a probability induced by a one unit change in an explanatory continuous variable.
[26] When calculating the marginal effect the other explanatory variables are usually fixed at their means value or their actual value. If they are fixed at their actual values the marginal effects are calculated for every observation and the sample average of the individual marginal effects is reported.
[27] This raises another issue. There are two "mean" predicted probabilities that can be calculated:

joint probabilities.[28] We also calculate the marginal effects at various percentiles to examine the change in a probability induced if a policy targeted only firms where the impact was expected to be the greatest.

- divide by the sample size, or
- divide by the number of establishments that change status.

The first calculation provides an estimate of the economy wide effect of a change in status (and this is the calculation we report). The second calculation provides an estimate of the effect of a change in status among "changers" (only establishment's that change status).

[28] Following Statistics Canada's recommendation we bootstrap the standard errors.

4. Empirical Results and Analysis

This section presents the main empirical results in two sections. We first provide a brief analysis based on descriptive statistics on training, expenditures, and number of workers trained by firm size. In the second section we analyze the results of the econometric analysis, which was based upon the model and estimation approach outlined above.

4.1 A Portrait of Training By Firm Size and Industry

Descriptive statistics for employer-provided classroom training, on-the-job training, and the training package, by firm size, are presented in Tables 3, 4 and 5, respectively. Tables 3 through 5 are summarized in Figures 1 and 2.

In Figure 1 the results indicate that the incidence of classroom and on-the-job training are higher at larger firms. Among large firms, there is a higher incidence of classroom training than on-the-job training. Conversely, small and medium firms have a higher incidence of on-the-job training than classroom training.

The training package variable had four possible outcomes or "training packages," including no training, only classroom training, only on-the-job training, and both classroom and on-the-job training. For this four-way choice (Figure 2) the highest incidence outcome, or training package, at small firms is "no training." The highest incidence training package offered at medium and large firms is "both classroom and on-the-job training." Only at small and medium firms is the incidence of "only offering on-the-job training" higher than the incidence of offering classroom training. Finally, only at large firms are the incidence of offering "classroom training only" higher than offering "only on-the-job."

4.2 Analysis of Training Outcomes, Firm Size and Industry Effects

4.2.1 Results for the Models of Training Outcomes

As outlined above, three different empirical models were estimated. The results of the empirical analyses of the training decision are presented in Tables 6 through 15. Probit estimates presented in Tables 6 (specification 1) and 7 (specification 2). Tables 8 (specification 1) and 12 (specification 2) includes the change in marginal probabilities of employer-provided training; and Tables 9 (specification 1) and 13 (specification 2) provides the change in conditional probabilities of employer-provided training. Finally, the changes in joint probabilities of employer-provided training are presented in Tables 10 and 11 (specification 1) and Tables 14 and 15 (specification 2). In each table, the results for each of the three models are presented in separate columns: the Single Equation Probit Model (M1) in column (1), followed by the results for the Bivariate Probit Model with Zero Correlation (M2) in the next two columns, and followed finally by the results for the Bivariate Probit Model with Correlation (M3) in the last two columns.

The Single Equation Probit Model (M1) and the Bivariate Probit Models with and without Correlation (M2 and M3) in some cases have estimated coefficients that are of opposite sign (refer to Table 6 and 7). For example, in Table 6 model M1 estimates the coefficient on Proportion Full-Time to be negative, whereas models M2 and M3 estimate the classroom training coefficient to be positive and the on-the-job training coefficient to be negative. That is, model M1 suggests that for an increase in the Proportion Full-Time, less classroom training is provided, whereas models M2 and M3 conclude more classroom training but less on-the job training is provided.

Consequently, we conclude that the Single Equation Probit Model (M1) over-aggregates the training decision and masks differences between the classroom and on-the-job training decisions. Our results suggest that approaches that examine only one method of training in isolation (for example, Frazis et al (2000) only consider classroom training) may be misspecified.

The Bivariate Probit Model with Correlation (M3) estimates a statistically significant correlation of 0.563 (Table 6) and 0.598 (Table 7) between the classroom training equation and the on-the-job training equation. Consequently, we can reject the hypothesis that the classroom and on-the-job training decisions are uncorrelated (i.e., the Bivariate Probit Model with Zero Correlation (M2)). The estimated coefficients in the Bivariate Probit Model with Zero Correlation (M2) and the full Bivariate Probit Model with Correlation (M3) are generally similar. In cases where M2 and M3 have estimated coefficients that are of opposite sign the coefficients are not statistically significant in either model. The effect of allowing for correlation shows up, in particular, in the estimated marginal effects for the conditional probabilities – the probability of classroom training given on-the-job training is provided, and the probability of on-the-job training given classroom training is provided – as well as the joint probabilities of training (e.g.

the probability that classroom and on-the-job training are both offered; or the probability that only classroom (on-the-job) training is offered; or the probability that no training is offered).

Comparing marginal effects we find, for example, that the conditional probability of classroom training given the firm provides on-the-job training, from model M2, is negative – but from model M3 it is positive for the proportion covered by a CBA (see Tables 9 and 13). Although the differences in marginal effects are small, they nonetheless suggest that accounting for the correlation makes a difference.

As a result of these considerations, in the following discussion of the results, we focus on the full Bivariate Probit Model with Correlation (M3).

4.2.2 Analysis of Training Outcomes

Establishment size:

Establishment size increases the likelihood that the establishment offers classroom or on-the-job training using Specification 1. Establishment size increases the likelihood that the establishment offers classroom training using Specification 2.

The marginal, conditional and joint (except for no training) probabilities increase with establishment size. Comparing the two specifications we find that probability of offering only on-the-job training is positively associated with establishment size in specification 1 (Table 11) and negatively associated with establishment size in specification 2 (Table 15). This is probably because specification 2 restricts the sample to establishments of size 10 and greater.

Industry:

A number of broad effects regularities arise from the analysis of probabilities of classroom and on-the-job training. We focus, in what follows, on the industries associated with training in contrast to those that are not.

(i) Industries that *raise* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
▪ Finance/Insurance ▪ Business Services ▪ Construction ▪ Communications/Utilities	▪ Education/Health Care ▪ Construction ▪ Finance/Insurance ▪ Retail/Commercial ▪ Business Services ▪ Communications/Utilities ▪ Secondary Manufacturing
These industries also *lower* the joint probabilities of *not* offering any training.	These industries also *lower* the joint probabilities of *not* offering any training.

(ii) Industries that *lower* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
▪ Labour Intensive Tertiary Manufacturing ▪ Primary Manufacturing ▪ Transport/Storage/Wholesale ▪ Secondary Manufacturing ▪ Real Estate ▪ Information/Cultural ▪ Education/Health Care ▪ Retail/Commercial ▪ Capital Intensive Tertiary Manufacturing ▪ Forestry/Mining	▪ Labour Intensive Tertiary Manufacturing ▪ Real Estate ▪ Forestry/Mining ▪ Transport/Storage/Wholesale ▪ Information/Cultural ▪ Primary Manufacturing ▪ Capital Intensive Tertiary Manufacturing

(iii) Industries that *lower* the joint probabilities of not offering training include:

Specification 1	Specification 2
▪ Finance/Insurance ▪ Business Services ▪ Capital Intensive Tertiary Manufacturing ▪ Construction ▪ Secondary Manufacturing ▪ Information/Cultural ▪ Communications/Utilities ▪ Forestry/Mining	▪ Education/Health Care ▪ Construction ▪ Business Services ▪ Finance/Insurance ▪ Retail/Commercial ▪ Capital Intensive Tertiary Manufacturing ▪ Communications/Utilities

(iv) Industries that *raise* the joint probabilities of not offering training include:

Specification 1	Specification 2
▪ Labour Intensive Tertiary Manufacturing ▪ Transport/Storage/Wholesale ▪ Primary Manufacturing ▪ Real Estate ▪ Retail/Commercial	▪ Labour Intensive Tertiary Manufacturing ▪ Real Estate ▪ Forestry/Mining ▪ Transport/Storage/Wholesale ▪ Information/Cultural ▪ Primary Manufacturing

(v) Industries that *lower* the conditional probabilities of offering classroom training given they offer on-the-job training:

Specification 1	Specification 2
▪ Secondary Manufacturing ▪ Information/Cultural ▪ Capital Intensive Tertiary Manufacturing ▪ Labour Intensive Tertiary Manufacturing ▪ Forestry/Mining ▪ Primary Manufacturing ▪ Construction ▪ Retail/Commercial ▪ Business Services	▪ Labour Intensive Tertiary Manufacturing ▪ Forestry/Mining ▪ Information/Cultural ▪ Capital Intensive Tertiary Manufacturing ▪ Real Estate ▪ Business Services ▪ Transport/Storage/Wholesale

(vi) Industries that *raise* the conditional probabilities of offering classroom training given they offer on-the-job training:

Specification 1	Specification 2
▪ Finance/Insurance ▪ Education/Health Care ▪ Communications/Utilities ▪ Real Estate ▪ Transport/Storage/Wholesale	▪ Finance/Insurance ▪ Communications/Utilities ▪ Retail/Commercial ▪ Primary Manufacturing ▪ Education/Health Care ▪ Secondary Manufacturing ▪ Construction ▪ Business Services ▪ Transport/Storage/Wholesale

(vii) Industries that *lower* the conditional probabilities of offering on-the-job training given they offer classroom training:

Specification 1	Specification 2
▪ Education/Health Care ▪ Transport/Storage/Wholesale ▪ Communications/Utilities ▪ Real Estate ▪ Labour Intensive Tertiary Manufacturing	▪ Real Estate ▪ Labour Intensive Tertiary Manufacturing ▪ Transport/Storage/Wholesale ▪ Primary Manufacturing ▪ Finance/Insurance ▪ Communications/Utilities ▪ Forestry/Mining

(viii) Industries that *raise* the conditional probabilities of offering on-the-job training given they offer classroom training:

Specification 1	Specification 1
▪ Secondary Manufacturing ▪ Capital Intensive Tertiary Manufacturing ▪ Business Services ▪ Information/Cultural ▪ Forestry/Mining ▪ Construction ▪ Finance/Insurance	▪ Business Services ▪ Education/Health Care ▪ Capital Intensive Tertiary Manufacturing ▪ Construction

Occupation:

Higher proportions of Professionals and Technical occupations within an establishment increase the likelihood of classroom training using Specification 1. Higher proportions of Professionals occupations within an establishment increase the likelihood of classroom training using Specification 2.

Higher proportions of Sales and Professional occupations within an establishment increase the likelihood of on-the-job training using Specification 1.

A number of further regularities arise from the analysis of probabilities of classroom and on-the-job training with respect to the proportion of the establishment accounted for by occupational category.

(i) Occupations that *raise* the joint probabilities of classroom only training include:

Specification 1	Specification 2
▪ Professional ▪ Managerial ▪ Technical	▪ Professional ▪ Technical

(ii) Occupations that *lower* the joint probabilities of classroom only training include:

Specification 1	Specification 2
▪ Sales ▪ Administrative	▪ Administrative ▪ Sales ▪ Managers

(iii) Occupations that *raise* the joint probabilities of on-the-job only training include:

Specification 1	Specification 2
▪ Sales ▪ Administrative ▪ Professional ▪ Technical	▪ Administrative ▪ Sales ▪ Managers

(iv) Occupations that *lower* the joint probabilities of on-the-job only training include:

Specification 1	Specification 2
▪ Managers	▪ Professional ▪ Technical

(v) Occupations that *lower* the conditional probability of classroom training given they offer on-the-job training include:

Specification 1	Specification 2
▪ Sales ▪ Administrative	▪ Administrative ▪ Sales

(vi) Occupations that *raise* the conditional probability of classroom training given they offer on-the-job training include:

Specification 1	Specification 2
▪ Professional ▪ Technical ▪ Managers	▪ Professional ▪ Technical ▪ Managers

(vii) Occupations that *lower* the conditional probability of on-the-job training given they offer classroom training include:

Specification 1	Specification 2
▪ Managers	▪ Professional ▪ Technical

(viii) Occupations that *raise* the conditional probability of on-the-job training given they offer classroom training include:

Specification 1	Specification 2
▪ Sales ▪ Professional ▪ Administrative ▪ Technical	▪ Administrative ▪ Sales ▪ Managers

***Innovation*:**

Process Innovation within an establishment increases the likelihood of classroom and on-the-job training (Specification 1).

A number of broad effects regularities arise from the analysis of probabilities of classroom and on-the-job training. We focus, in what follows, on the innovation associated with training in contrast to those that are not.

(i) Innovations that *raise* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
▪ Process & Product Innovation ▪ Process Innovation Only	▪ Process & Product Innovation ▪ Process Innovation Only ▪ Product Innovation Only
These innovations also *lower* the joint probabilities of *not* offering any training.	These innovations also *lower* the joint probabilities of *not* offering any training.

(ii) Innovations that *lower* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
▪ No Innovation ▪ Product Innovation Only	▪ No Innovation
These innovations also *raise* the joint probabilities of *not* offering any training.	These innovations also *raise* the joint probabilities of *not* offering any training.

(iii) Innovations that *lower* the conditional probabilities of offering classroom training given they offer on-the-job training:

Specification 1	Specification 2
▪ No Innovation	▪ No Innovation

(iv) Innovations that *raise* the conditional probabilities of offering classroom training given they offer on-the-job training:

Specification 1	Specification 2
▪ Process & Product Innovation	▪ Process & Product Innovation

▪ Process Innovation Only	▪ Product Innovation Only

(v) Innovations that *lower* the conditional probabilities of offering on-the-job training given they offer classroom training:

Specification 1	Specification 2
▪ No Innovation	▪ No Innovation

(vi) Innovations that *raise* the conditional probabilities of offering on-the-job training given they offer classroom training:

Specification 1	Specification 1
▪ Process & Product Innovation ▪ Process Innovation Only	▪ Process & Product Innovation ▪ Process Innovation Only ▪ Product Innovation Only

***Turnover*:**

Establishments that have downsized have a higher likelihood of on-the-job training (Specification 1).
Establishments that have higher turnover rates have a higher likelihood of classroom training (Specification 2).

Turnover also raises (Specifications 1 and 2) the joint probabilities of offering classroom and on-the-job training, lowering (Specification 2) the joint probability of no training. Turnover raises (lowers) the conditional probabilities of offering classroom (on-the-job) training given they offer on-the-job (classroom) training in both Specifications 1 and 2.

***Competition*:**

A number of broad effects regularities arise from the analysis of probabilities of classroom and on-the-job training. We focus, in what follows, on the innovation associated with training in contrast to those that are not.

(i) Competition that *raises* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
▪ Proportion Canadian Sales These also *lower* the joint probabilities of *not* offering any training.	▪ Proportion ROW Sales ▪ Proportion Canadian Sales These industries also *lower* the joint probabilities of *not* offering any training.

(ii) Competition that *lowers* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
▪ Proportion ROW Sales ▪ Proportion USA Sales These industries also *raise* the joint probabilities of *not* offering any training.	▪ Proportion USA Sales These also *raise* the joint probabilities of *not* offering any training.

(iii) Competition that *lowers* the conditional probabilities of offering classroom training given they offer on-the-job training:

Specification 1	Specification 2
▪ Proportion ROW Sales ▪ Proportion Canadian Sales ▪ Proportion USA Sales	▪ Proportion USA Sales ▪ Proportion Canadian Sales

(iv) Competition that *raises* the conditional probabilities of offering classroom training given they offer on-the-job training:

Specification 1	Specification 2
	▪ Proportion ROW Sales

(v) Competition that *lowers* the conditional probabilities of offering on-the-job training given they offer classroom training:

Specification 1	Specification 2
▪ Proportion USA Sales ▪ Proportion ROW Sales	▪ Proportion USA Sales

(vi) Competition that *raises* the conditional probabilities of offering on-the-job training given they offer classroom training:

Specification 1	Specification 1
▪ Proportion Canadian Sales	▪ Proportion Canadian Sales ▪ Proportion ROW Sales

***Institutional*:**

Establishments with health & safety CBA provisions have a lower likelihood of classroom training (Specification 1).

Establishments with participation CBA provisions have a higher likelihood of classroom training (Specification 2).

A number of broad effects regularities arise from the analysis of probabilities of classroom and on-the-job training. We focus, in what follows, on the CBA clauses associated with training in contrast to those that are not.

(i) CBA clauses that *raise* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
▪ Participation ▪ Technological ▪ Education Training These CBA clauses also *lower* the joint probabilities of *not* offering any training.	▪ Participation These CBA clauses also *lower* the joint probabilities of *not* offering any training.

(ii) CBA clauses that *lower* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
▪ Health and Safety ▪ Reorganization	▪ Health and Safety ▪ Reorganization ▪ Technological ▪ Education Training These CBA clauses also *raise* the joint probabilities of *not* offering any training.

(iii) CBA clauses that *raise* the joint probabilities of not offering training include:

Specification 1	Specification 2
▪ Health and Safety	▪ Technological ▪ Health and Safety ▪ Education Training

(iv) CBA clauses that *lower* the joint probabilities of not offering training include:

Specification 1	Specification 2
▪ Participation ▪ Technological ▪ Reorganization ▪ Education Training	▪ Participation

(v) CBA clauses that *raise* the conditional probabilities of offering classroom training given they offer on-the-job training include:

Specification 1	Specification 2
▪ Reorganization ▪ Participation ▪ Education Training	▪ Participation ▪ Reorganization

(vi) CBA clauses that *lower* the conditional probabilities of offering classroom training given they offer on-the-job training include:

Specification 1	Specification 2
▪ Health and Safety ▪ Technological	▪ Health and Safety ▪ Technological ▪ Education Training

(vii) CBA clauses that *raise* the conditional probabilities of offering on-the-job training given they offer classroom training include:

Specification 1	Specification 2
▪ Health and Safety ▪ Technological ▪ Participation ▪ Education Training	▪ Health and Safety ▪ Technological ▪ Participation ▪ Education Training

(viii) CBA clauses that *lower* the conditional probabilities of offering on-the-job training given they offer classroom training include::

Specification 1	Specification 2
▪ Reorganization	▪ Reorganization

***Firm Characteristics*:**

The higher the percentage of assets foreign held the higher the likelihood of on-the-job training (Specification 1). The higher the relative 2060 earnings gap the greater the likelihood of classroom training (Specification 1).

Multi-establishment firms have a greater likelihood of classroom training (Specification 2)

An increase in the proportion of the establishment employed full-time increases the probability of offering only classroom training and decreases the probability of offering only on-the-job training (Specifications 1 and 2). An increase in the proportion of the establishment employed full-time raises (lowers) the conditional probabilities of offering classroom (on-the-job) training given they offer on-the-job (classroom) training include

***Business Strategy*:**

Establishments pursuing more R&D Business Strategies have a higher likelihood of classroom training (specification 1).

Work Organization:

Establishments with problem solving teams have a higher likelihood of offering classroom training and on-the-job training.

A number of broad effects regularities arise from the analysis of probabilities of classroom and on-the-job training. We focus, in what follows, on the work organization practices associated with training in contrast to those that are not.

(i) Work organization practices that *raise* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
	▪ Problem Solving Teams ▪ Flexible Job Design These practices also *lower* the joint probabilities of *not* offering any training.

(ii) Work organization practices that *lower* the joint probabilities of offering both classroom and on-the-job training include:

Specification 1	Specification 2
	▪ Self-Directed Work Groups ▪ Labour-Management Committees These practices also *raise* the joint probabilities of *not* offering any training.

(iii) Work organization practices that *raise* the joint probabilities of not offering training include:

Specification 1	Specification 2
	▪ Self-Directed Work Groups ▪ Labour-Management Committees

(iv) Work organization practices that *lower* the joint probabilities of not offering training include:

Specification 1	Specification 2
	▪ Problem Solving Teams ▪ Flexible Job Design

(v) Work organization practices that *raise* the conditional probabilities of offering classroom training given they offer on-the-job training include:

Specification 1	Specification 2
	▪ Problem Solving Teams

(vi) Work organization practices that *lower* the conditional probabilities of offering classroom training given they offer on-the-job training include:

Specification 1	Specification 2
	▪ Self-Directed Work Groups ▪ Labour-Management Committees ▪ Flexible Job Design

(vii) Work organization practices that *raise* the conditional probabilities of offering on-the-job training given they offer classroom training include:

Specification 1	Specification 2
	▪ Problem Solving Teams ▪ Self-Directed Work Groups ▪ Flexible Job Design

(viii) Work organization practices that *lower* the conditional probabilities of offering on-the-job training given they offer classroom training include::

Specification 1	Specification 2
	▪ Labour-Management Committees

***O**ther*:

Relative to Ontario, establishments located in Quebec (BC) have a lower (higher) likelihood of on-the-job training (Specification 1).

4.2.3 Analysis of Training Expenditures

The results of the empirical analyses of training expenditures are presented in Tables 16 (specification 1) and 18 (specification 2) (M1 and M2) and Tables 17 (specification 1) and 19 (specification 2) (M3). The Single Equation Selection model (M1) and the Bivariate Equation Selection Models (M2 and M3) in some instances have estimated coefficients that are of opposite sign. For example, model M1 estimates the 20+ competing firms coefficient to be negative (although not statistically significant) whereas model M3 estimates the 20+ competing firms coefficient to be positive for classroom only training expenditures (Specifications 1 and 2). We conclude that the Single Equation Selection model (M1) masks differences between classroom and on-the-job training expenditures.

For training expenditures the differences in the estimated coefficients are more pronounced between the Bivariate Equation Selection Model with zero correlation (M2) and the Bivariate Equation Selection Model with correlation (M3) than for the training outcome decision models. Since the correlation between the classroom training decision and the on-the-job training decision was previously found to be positive we discuss model M3. Accounting for the positive correlation between the training decisions appears to matter.

***Establishment size*:**

Specification 1	Specification 2
▪ Larger establishments spend less per employee for classroom only training and on-the-job only training	▪ Larger establishments spend less per employee for classroom only training and for classroom/on-the-job (both) training

Industry and Occupation:

Specification 1	Specification 2
▪ Relative to Primary Manufacturing, Forestry/Mining, Secondary Manufacturing, Capital Intensive Tertiary Manufacturing, Construction, and Business Services spend more per employee on classroom/on-the-job (both) training	▪ Relative to Primary Manufacturing, Forestry/Mining, Capital Intensive Tertiary Manufacturing, Construction, and Education/Health Care spend more per employee on classroom/on-the-job (both) training

Innovation:

Specification 1	Specification 2
▪ Process innovation increases classroom and on-the-job (both) training expenditures per employee	▪ Process innovation increases classroom only training expenditures per employee

Competition:

Specification 1	Specification 2
▪ The number of competing firms increases classroom only training expenditures per employee ▪ Competition with U.S. firms increases classroom and on-the-job (both) training expenditures per employee	▪ The number of competing firms increases classroom only training expenditures per employee ▪ Competition with U.S. firms increases classroom and on-the-job (both) training expenditures per employee

Institutional:

Specification 1	Specification 2
▪ The presence of a Human Resources unit increases classroom/on-the-job (both) training expenditures per employee ▪ The higher the proportion of employees covered by a CBA the higher on-the-job training expenditures per employee	▪ The presence of a Human Resources unit increases classroom/on-the-job (both) training expenditures per employee

Firm Characteristics:

Specification 1	Specification 2
▪ The higher proportion full-time increases classroom/on-the-job (both) training expenditures per employee	▪ The higher proportion full-time increases classroom/on-the-job (both) training expenditures per employee ▪ The greater the relative 206-earnings gap the lower classroom/on-the-job (both) training expenditures per employee

Business Strategy:

Specification 1	Specification 2
▪ The number of R&D business strategies increases classroom/on-the-job (both) training expenditures per employee ▪ The number of organizational business strategies increases classroom/on-the-job (both) training expenditures per employee and classroom only training expenditures per employee	

Other:

Quebec, relative to Ontario, has higher expenditures per employee for classroom only training (specification 2).

5. Concluding Analysis and Skills-Related Policies

Increasing the skills and education of the workforce has been identified as a key priority of both business leaders as well as researchers.[29] While formal education is one element of building human capital, another are the skills acquired, either formally or informally, once they are on the job. This paper has focused on the determinants of the incidence and intensity of employer-supported training.

Our analysis builds upon previous work in three ways. First, we estimated the classroom and on-the-job training decisions as being correlated and simultaneously made, whereas previous analyses tend to estimate these training outcomes as separate ones. Second, we estimated the training expenditure equation taking into account the bivariate selection decision. Finally, we specifically examined the effect of collective agreement clauses and work organization practices, in addition to the variables traditionally controlled for in previous studies.

We model the firm's training decision as one in which the employer chooses some combination of classroom and on-the-job training that best corresponds to their overall training strategy and maximizes profits. However, the employer decision to provide training is influenced by various factors and firm characteristics. Following Chaykowski and Slotsve (2005), we consider three separate models of the employer sponsored decision to provide classroom and on-the-job training, corresponding to the employer viewing the provision of these modes of training as either: not distinct; or as distinct decisions that are uncorrelated but simultaneous; or, as distinct decisions that are correlated but simultaneous. We consider the appropriate model of an establishment's training decision as one where the firm views the provision of classroom and on-the-job training as distinct but correlated decisions that are simultaneously made. In particular, we find that not distinguishing between the classroom training decision and the on-the-job training decision masks important differences between the decisions.

Consistent with results from the literature, firm size increases the likelihood that an establishment offers classroom or on-the-job training. However, we also find that larger establishments spend less per employee for when offering only classroom training and less when offering both classroom and on-the-job training.

A number of the service sector industries, notably business services, finance/insurance and communications/utilities are associated with a higher likelihood of offering both classroom and on-the-job training and with a lower likelihood of not offering any training; this is also the case for the construction industry. Interestingly, several segments of the manufacturing sector, including primary and tertiary manufacturing industries are less likely to offer both classroom and on-the-job training. Thus a key result is the relatively low likelihood and intensity of training in segments of manufacturing and in the retail-commercial industries. The variance in training activity and intensity across

[29] For a general argument in favour of enhancing human capital, see Courchene (2001). In 2005, the Canadian Council of Chief Executives also identified workforce skills as a key policy priority. Also see the review by Riddell (1995).

industries highlights the importance of targeting policies aimed at encouraging further training among employers.

A number of regularities arise from the analysis of probabilities of classroom and on-the-job training with respect to the proportion of the establishment accounted for by occupational category. In particular, higher proportions of professional and technical occupations within an establishment increase the probability of offering both classroom and on-the-job training.

Other noteworthy results relate to innovation, turnover, market sales and the composition of the workforce. Process and product innovation generally raises the probabilities of classroom and on-the-job training, while lowering the joint probability of no training; process innovation is also associated with higher classroom training expenditures. Similarly, higher turnover also raises the probabilities of offering classroom and on-the-job training, and is associated with lower probabilities of offering no training.

A higher proportion of domestic sales raises the likelihood of classroom and on-the-job training and lowers the probability of no training. Competition with U.S. firms increases training expenditures per employee when both classroom and on-the-job training are provided. Additionally, establishments with a higher proportion of full-time workers are also associated with more classroom training but a lower likelihood of on-the-job training – and higher training expenditure per employee.. The presence of a human resources unit increases training expenditures per employee when both classroom and on-the-job training are provided.

Firm characteristics other than firm size and industry are also found to be important factors in training outcomes. High turnover, and process and product innovation, both raise the probability firms' offers both classroom and on-the-job training, while lowering the probability of offering no training at all – and are also associated with higher training expenditures per employee. In the case of innovation, which is often associated with firms' competitiveness, the results are consistent with the important role of human capital formation in supporting innovation.

The empirical results also support the result that controlling institutional factors matters. Interestingly, collective agreement clauses dealing with employee participation raise the probability of offering both classroom and on-the-job training (and lower the joint probability of not offering any training). However, the presence of a number of contract clauses, related to health and safety, technological change, and education and training raises the probability of not offering training, increases the joint probability of offering only on-the-job training, and decreases the joint probability of offering classroom training only.

Alternative forms of work organization and arrangements also have an impact on training outcomes. Having flexible job design, and problem-solving teams increases the joint probability of offering both classroom and on-the-job training (and in the case of flexible job design also increases the joint probability of offering only on-the-job training). Other

arrangements also impact the likelihood of offering different types of training. The presence of labour-management committees increases the joint probability of offering only classroom training while having self-directed work groups increases the joint probability of offering only on-the-job training. Institutional arrangements therefore have a significant and differential impact on training outcomes.

The overall results have several implications for training programs and policy, especially with regard to informing approaches to the targeting of skill-related policies. Both the size distribution of firms, as well as the relative importance of different industries, has shifted considerably over the past several decades; so too, has the competitive context. The results suggest that, as a general principle, training policy may be most effective when directed toward the particular requirements of employers. Aiming training-related policies broadly – essentially across all firms or workers without accounting for their particular circumstances (that is, not accounting for important differences in industry, occupational, and institutional contexts) – may result in a poor match of policies to the requirements of employers and may be inefficient.

For example, the results indicate that firm size effects, occupation, industry effects, institutional arrangements can matter a great deal. Thus, policy aimed at enhancing employer-based training may need to target small firms in order to increase the training activity (incidence) but target larger firms in order to increase training intensity. In addition, policies may need to be aimed at specific occupations or industries in which the likelihood of offering either classroom or on-the-job training is lowest. Segments of the manufacturing industry fit this profile.

Facilitating training activity among firms that are innovators in their products and processes and that tend already to train would further support their ability to compete. Similarly, firms that experience high turnover tend to engage in training, which is consistent with a need to train new employees. Policy directed at firms with high turnover rates may facilitate productivity growth at these firms. The empirical results also suggest that firms that employ a large proportion of professional workers are engaged in a high degree of training, which is consistent with a need for lifelong learning/training. The institutional context matters, including whether or not they are unionized and the extent to which they adopt various work practices that are often associated with high performance work systems.

These considerations point to the key issue of whether or not firms train because of inadequate supply in the labour market (e.g., bottlenecks), skill mismatches between their workers and emerging production requirements, or because the skills they seek to impart through employer-based training are highly firm-specific (e.g., because of the institutional context). In the first instance, training policies may need to carefully distinguish among firms (establishments), in different industries or in certain occupations, in terms of whether or not they face skill bottlenecks in the labour market. The effectiveness of policies may also benefit by distinguishing among firms that have different levels of general versus specific training requirements and institutional arrangements in order to target firms according to the type of skills training they require.

Given these results, the next step in our analysis will be to estimate the bivariate training decision model using a random-effects probit panel estimator. This will allow take advantage of the panel nature of WES in order to control for establishment-level effects on training outcomes.

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Figure 1: Employer Sponsored Training by Firm Size and Year

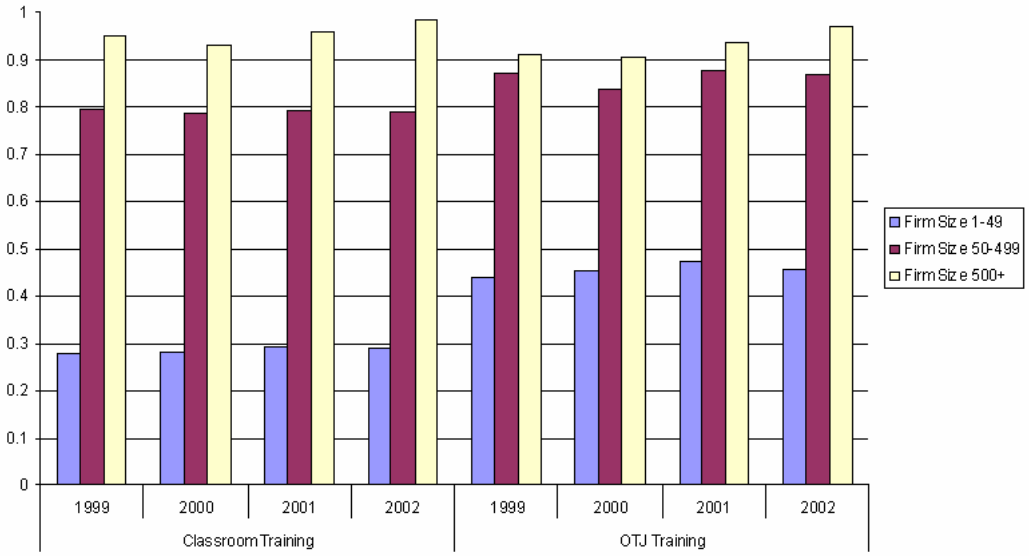

Figure 2: Employer Provided Training Package by Firm Size and Year

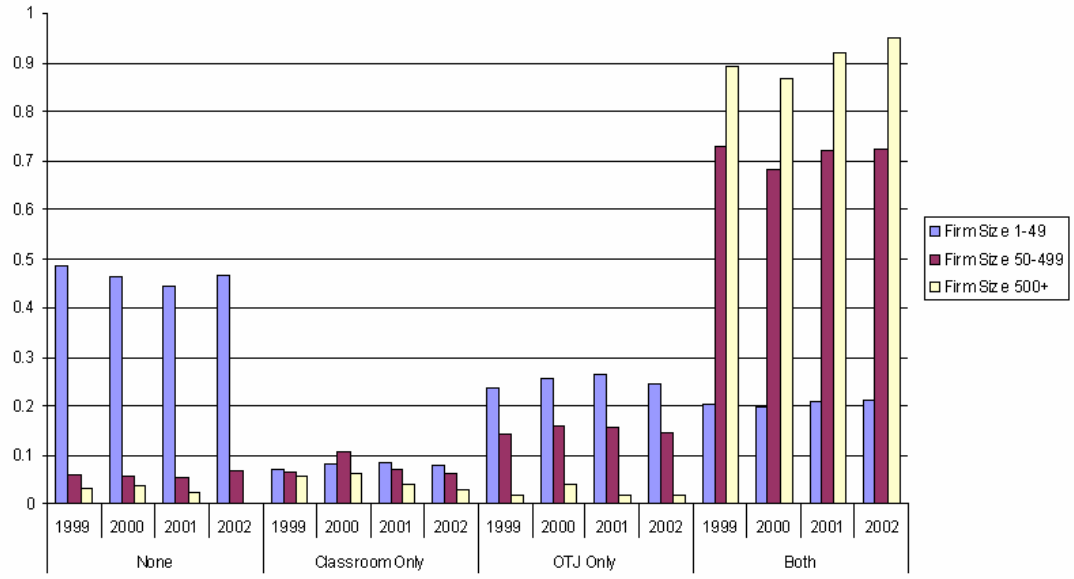

Table 1
Variable Definitions

Variable	*Definition*
Establishment Size	
Firm Size	= Total employment at the establishment
Firm Size 1-49	= 1 if the establishment has 1-49 employees (0 otherwise) – omitted
Firm Size 50-499	= 1 if the establishment has 50-499 employees (0 otherwise)
Firm Size 500+	= 1 if the establishment has 500+ employees (0 otherwise)
Industry	
Forestry/Mining	= 1 if Forestry/Mining (0 otherwise)
Labor Intensive Tertiary Manu.	= 1 if Labor Intensive Tertiary Manufacturing (0 otherwise)
Primary Manufacturing	= 1 if Primary Manufacturing (0 otherwise) – omitted
Secondary Manufacturing	= 1 if Secondary Manufacturing (0 otherwise)
Capital Intensive Tertiary Manu.	= 1 if Capital Intensive Tertiary Manufacturing (0 otherwise)
Construction	= 1 if Construction (0 otherwise)
Transport/Storage/Wholesale	= 1 if Transport/Storage/Wholesale (0 otherwise)
Communications/Utilities	= 1 if Communications/Utilities (0 otherwise)
Retail/Commercial	= 1 if Retail/Commercial (0 otherwise)
Finance/Insurance	= 1 if Finance/Insurance (0 otherwise)
Real Estate	= 1 if Real Estate (0 otherwise)
Business Services	= 1 if Business Services (0 otherwise)
Education/Health Care	= 1 if Education/Health Care (0 otherwise)
Information/Cultural	= 1 if Information/Cultural (0 otherwise)
Occupation	
Proportion Managers	= Proportion of workforce that are Managers
Proportion Professional	= Proportion of workforce that are Professional
Proportion Sales	= Proportion of workforce that are Sales
Proportion Administrative	= Proportion of workforce that are Administrative
Proportion Technical	= Proportion of workforce that are Technical
Proportion Production	= Proportion of workforce that are Production – omitted
Innvoation	
Process Innovation	= 1 if new or improved process (0 otherwise)
Product Innovation	= 1 if new or improved product (0 otherwise)
Region	
Atlantic	= 1 if Atlantic province (0 otherwise)
Quebec	= 1 if Quebec (0 otherwise)
Ontario	= 1 if Ontario (0 otherwise) – omitted
Prairie	= 1 if Manitoba or Saskatchewan (0 otherwise)
Alberta	= 1 if Alberta (0 otherwise)
BC	= 1 if British Columbia (0 otherwise)
Turnover	
Proportion Quits	= Percentage of workforce that quit
Proportion New Hires	= Percentage of workforce that are new hires
Proportion Dismissed	= Percentage of workforce that was dismissed
Turnover	= Proportion New Hires – Proportion Quits – Proportion Dismissed
Downsized	= 1 if establishment downsized (0 otherwise)

Competition	
Compete Local	= 1 if compete Local-Owned (0 otherwise)
Compete Canada	= 1 if compete Canada-Owned (0 otherwise)
Compete USA	= 1 if compete USA-Owned (0 otherwise)
Compete Rest-of-World	= 1 if compete Rest-of-World-Owned (0 otherwise)
No Competition	= 1 if no competitors (0 otherwise) – omitted
No Competitors	= 1 if no competitors (0 otherwise) – omitted
1-5 Competing Firms	= 1 if 1-5 competing firms (0 otherwise)
6-20 Competing Firms	= 1 if 6-20 competing firms (0 otherwise)
20+ Competing Firms	= 1 if 20+ competing firms (0 otherwise)
Proportion Local Sales	= Percentage of total sales accounted for locally
Proportion Canada Sales	= Percentage of total sales accounted for in Canada
Proportion USA Sales	= Percentage of total sales accounted for in the USA
Proportion ROW Sales	= Percentage of total sales accounted for in the Rest-of-the-World
Business Strategy	
R&D Business Strategy	= Number of R&D business strategies (undertaking R&D, develop new products/services, develop new production operating techniques, expanding in new geographical areas, improve product/service quality)
Organizational Business Strategy	= Number of Organizational Change business strategies (TQM, use more part-time/temporary/contract workers, reorganize the work process, enhance labour-management cooperation, increase employee skills, increase employee involvement)
Cost Control Business Strategy	= Number of Cost Control business strategies (reduce labour costs, reduce other operating costs, improve coordination with customer/supplier, improve measures of performance)
Institutional	
Covered by CBA	= 1 if establishment is covered by a CBA (0 otherwise)
Proportion Covered by CBA	= Proportion of workforce covered by a CBA
HR Unit	= 1 if the establishment has a HR unit
CBA Clauses	
Technological Provisions	= 1 if the CBA has Technological Provisions (0 otherwise)
Reorganization Provisions	= 1 if the CBA has Reorganization Provisions (0 otherwise)
Participation Provisions	= 1 if the CBA has Participation Provisions (0 otherwise)
Health & Safety Provisions	= 1 if the CBA has Health & Safety Provisions (0 otherwise)
Education Training Provisions	= 1 if the CBA has Education Training Provisions (0 otherwise)
Work Organization	Only defined for establishments with more than 10 employees
Flexible Job Design	= 1 if Flexible Job Design (0 otherwise)
Problem Solving Teams	= 1 if Problem Solving Teams (0 otherwise)
Labour-Management Committees	= 1 if Labour-Management Committees (0 otherwise)
Self-Directed Work Groups	= 1 if Self-Directed Work Groups (0 otherwise)
Firm Characteristics	
Percentage Assets Foreign held	= Percentage of firm assets Foreign held
Proportion Full-Time	= Proportion of the workforce that is employed Full-Time
Multi-establishment	= 1 if the firm has establishments at more than one “statistical” location (0 otherwise)
Relative 2060 Earnings	= Proportion of workers at the establishment with annual earnings between $20,000 and $60,000 divided by the Proportion of workers in the industry with annual earnings between $20,000 and $60,000

Training	
Classroom	= 1 if classroom training (0 otherwise)
Classroom Basic	= 1 if basic (orientation, literacy and numeracy) classroom training (0 otherwise)
Classroom Occupational	= 1 if occupational (management/supervisory training, professional training, apprenticeship training, sales and marketing training) classroom training (0 otherwise)
Classroom Organizational	= 1 if organizational (group decision-making or problem solving, teambuilding, leadership, communication, occupational health & safety, environmental protection) classroom training (0 otherwise)
Classroom Technical	= 1 if technical (computer hardware, computer software, other office and non-office equipment) classroom training (0 otherwise)
OTJ	= 1 if on-the-job training (0 otherwise)
OTJ Basic	= 1 if basic (orientation, literacy and numeracy) on-the-job training (0 otherwise)
OTJ Occupational	= 1 if occupational (management/supervisory training, professional training, apprenticeship training, sales and marketing training) on-the-job training (0 otherwise)
OTJ Organizational	= 1 if organizational (group decision-making or problem solving, teambuilding, leadership, communication, occupational health & safety, environmental protection) on-the-job training (0 otherwise)
OTJ Technical	= 1 if technical (computer hardware, computer software, other office and non-office equipment) on-the-job training (0 otherwise)
Training Package	= 1 if no training offered = 2 if only classroom training is offered = 3 if only on-the-job training is offered = 4 if both classroom and on-the-job training are offered

Table 2
Means of Key Variables by Year

Variable				
	1999	2000	2001	2002
Firm Size	12.94	14.50	14.46	15.65
Firm Size 1-49	.9617	.9522	.9533	.9470
Firm Size 50-499	.0367	.0460	.0451	.0512
Firm Size 500+	.0014	.0017	.0015	.0017
Industry				
Forestry/Mining	.0200	.0203	.0163	.0150
Labor Intensive Tertiary Manu.	.0332	.0324	.0363	.0352
Primary Manufacturing	.0108	.0117	.0136	.0152
Secondary Manufacturing	.0197	.0216	.0221	.0235
Capital Intensive Tertiary Manu.	.0265	.0270	.0305	.0322
Construction	.0823	.0773	.0737	.0778
Transport/Storage/Wholesale	.1347	.1359	.1196	.1187
Communications/Utilities	.0110	.0110	.0125	.0119
Retail/Commercial	.3488	.3465	.3268	.3354
Finance/Insurance	.0466	.0489	.0563	.0575
Real Estate	.0419	.0370	.0421	.0400
Business Services	.1159	.1185	.1410	.1262
Education/Health Care	.0928	.0954	.0902	.0933
Information/Cultural	.0153	.0156	.0182	.0175
Occupation				
Proportion Managers	.2076	.2104	.2726	.2429
Proportion Professional	.0736	.0824	.0663	.0546
Proportion Sales	.1227	.1308	.1342	.1110
Proportion Administrative	.2170	.2167	.1925	.1843
Proportion Technical	.1564	.1500	.1436	.1650
Proportion Production	.2224	.2093	.1907	.2419
Institutional				
Covered by a CBA	.0701	.0650	.0791	.1277
Proportion Covered by CBA	.0463	.0428	.0521	.0883
HR Unit	.0259	.0263	.0248	.0251
Turnover				
Turnover	.1335	.1338	.1132	.0886
Downsized	.0878	.0774	.0666	.0620
Firm Characteristics				
Percentage Assets Foreign held	3.252	3.224	3.755	4.520
Proportion Full-Time	.7304	.7374	.7171	.7131
Multi-establishment	.1606	.1723	.1696	.1821
Relative 2060 Earnings	.9460	.9777	1.013	1.034
Competition				
Compete Local	.7858	.7896	.7950	.8022
Compete Canada	.3964	.4137	.4158	.4290
Compete USA	.2303	.2397	.2207	.2230
Compete Rest-of-World	.1238	.1285	.1183	.1165
No Competitors	.0348	.0358	.0302	.0268

1-5 Competing Firms	.3613	.3590	.3870	.3937
6-20 Competing Firms	.2911	.2996	.3000	.3034
20+ Competing Firms	.3126	.3054	.2825	.2759
Proportion Sales Local	85.98	87.09	83.67	85.85
Proportion Canada Sales	9.512	8.437	10.78	9.167
Proportion USA Sales	2.919	3.264	3.621	3.493
Proportion ROW Sales	1.126	1.199	1.921	1.486
Number of Business Strategies				
R&D Business Strategy	2.583	2.648	2.596	2.602
Organizational Business Strategy	3.789	3.861	3.724	3.757
Cost Control Business Strategy	3.008	3.068	2.989	3.017
Region				
Atlantic	.0907	.0934	.0876	.0881
Quebec	.2178	.2127	.1927	.2000
Ontario	.3545	.3516	.3877	.3934
Prairie	.0736	.0744	.0620	.0596
Alberta	.1089	.1142	.1111	.1085
BC	.1543	.1535	.1587	.1500
CBA Clauses				
Technological Provisions	.5774	.5702	.3965	.3944
Reorganization Provisions	.5463	.5571	.3876	.3819
Participation Provisions	.5868	.6066	.5056	.5041
Health & Safety Provisions	.2543	.2372	.1550	.1454
Education Training Provisions	.4161	.4166	.3135	.2981
Work Organization				
Flexible Job Design	.3143	.3142	.1754	.1709
Problem Solving Teams	.2675	.2645	.1899	.1935
Labour-Management Committees	.1765	.1782	.1366	.1372
Self-Directed Work Groups	.1036	.1083	.0695	.0710
Training				
Number Receiving Classroom	4.270	5.328	5.138	5.410
Number Receiving On-the-Job	5.301	6.256	6.433	6.640
Expenditure Classroom	3576.43	6187.34	4774.42	4947.61
Expenditure On-the-Job	601.62	814.25	932.66	835.58
Number of Observations	4871	4631	4479	4118

Source: WES 1999-2002, author's calculations.

Table 3
Employer Provided Classroom Training by Firm Size and Year

Firm Size 1-49	1999	2000	2001	2002
Classroom	.2769	.2796	.2925	.2887
Basic	.0802	.0864	.0904	.0977
Occupational	.1863	.1740	.1901	.1901
Organization	.1170	.1236	.1127	.1183
Technical	.1388	.1345	.1262	.1097
Proportion Trained	.1738	.1902	.2029	.1872
Expenditure per Worker	541.19	603.43	494.74	565.93
Firm Size 50-499				
Classroom	.7946	.7862	.7903	.7867
Basic	.5093	.5081	.5259	.5378
Occupational	.6613	.6318	.6454	.6739
Organization	.6071	.5743	.5741	.5802
Technical	.6116	.5670	.5629	.5198
Proportion Trained	.4014	.4438	.4005	.4170
Expenditure per Worker	413.57	1146.89	501.32	414.21
Firm Size 500+				
Classroom	.9490	.9271	.9585	.9814
Basic	.7061	.7085	.8475	.7812
Occupational	.9123	.8968	.9036	.8726
Organization	.8613	.8150	.9000	.8936
Technical	.8127	.7500	.8548	.7775
Proportion Trained	.5157	.5658	.6303	.5840
Expenditure per Worker	700.09	702.24	821.62	771.67
All Firms				
Classroom	.2970	.3040	.3160	.3155
Basic	.0969	.1069	.1112	.1214
Occupational	.2049	.1963	.2117	.2161
Organization	.1362	.1455	.1348	.1434
Technical	.1572	.1555	.1470	.1319
Proportion Trained	.1827	.2025	.2125	.1997
Expenditure per Worker	529.51	677.74	497.05	546.86

Source: WES 1999-2002, author's calculations.

Table 4
Employer Provided On-The-Job Training by Firm Size and Year

Firm Size 1-49	1999	2000	2001	2002
On-the-Job	.4400	.4552	.4724	.4564
Basic	.2643	.2676	.2948	.2740
Occupational	.2374	.2746	.2430	.2611
Organization	.1523	.1468	.1387	.1321
Technical	.2112	.1829	.2029	.1854
Proportion Trained	.2890	.2785	.3285	.3189
Expenditure per Worker	90.60	77.00	70.29	90.75
Firm Size 50-499				
On-the-Job	.8721	.8371	.8743	.8685
Basic	.7116	.6580	.6859	.6660
Occupational	.6481	.6174	.6561	.7054
Organization	.5393	.5327	.5068	.5274
Technical	.6129	.5620	.5385	.5320
Proportion Trained	.4550	.5112	.5046	.5143
Expenditure per Worker	53.23	73.65	110.47	79.91
Firm Size 500+				
On-the-Job	.9099	.9035	.9353	.9690
Basic	.7582	.7466	.7963	.8306
Occupational	.7357	.7757	.7743	.8430
Organization	.6552	.7813	.7365	.7688
Technical	.7476	.6928	.7487	.7836
Proportion Trained	.4378	.5061	.5176	.5294
Expenditure per Worker	61.26	149.46	105.94	97.75
All Firms				
On-the-Job	.4566	.4735	.4913	.4784
Basic	.2815	.2864	.3132	.2951
Occupational	.2533	.2913	.2624	.2849
Organization	.1673	.1657	.1563	.1535
Technical	.2268	.2012	.2188	.2042
Proportion Trained	.2953	.2896	.3367	.3293
Expenditure per Worker	86.66	77.02	74.80	89.38

Source: WES 1999-2002, author's calculations.

Table 5
Employer Provided Training Package by Firm Size and Year

Firm Size 1-49	1999	2000	2001	2002
No Training	.4870	.4632	.4447	.4653
Classroom Only	.0728	.0815	.0828	.0781
OTJ Only	.2359	.2571	.2627	.2458
Both	.2040	.1980	.2097	.2106
Firm Size 50-499				
No Training	.0610	.0562	.0545	.0677
Classroom Only	.0668	.1065	.0711	.0637
OTJ Only	.1443	.1575	.1551	.1455
Both	.7277	.6796	.7192	.7229
Firm Size 500+				
No Training	.0331	.0347	.0243	.0000
Classroom Only	.0568	.0616	.0402	.0309
OTJ Only	.0177	.0381	.0170	.0185
Both	.8921	.8654	.9182	.9505
All Firms				
No Training	.4707	.4437	.4264	.4441
Classroom Only	.0726	.0826	.0822	.0773
OTJ Only	.2322	.2521	.2575	.2402
Both	.2243	.2214	.2337	.2381

Source: WES 1999-2002, author's calculations.

Table 6
Employer Provided Training Probit Estimates 2002

Variable	Probit	Independent Probit		Bivariate Probit	
	Training Probit	Classroom Probit	OTJ Probit	Classroom Probit	OTJ Probit
Ln(Firm Size)	.554***	.441***	.544***	.525***	.539***
	(.0548)	(.0542)	(.0734)	(.0721)	(.0741)
Industry					
Forestry/Mining	.076	.524*	.226	.080	.264
	(.3806)	(.3072)	(.4580)	(.3672)	(.4672)
Labor Intensive Tertiary Manu.	-.346	-.058	-.150	-.171	-.126
	(.3187)	(.2460)	(.3520)	(.3079)	(.3668)
Secondary Manufacturing	-.199	-.049	.318	-.084	.369
	(.3005)	(.2667)	(.3939)	(.2911)	(.3611)
Capital Intensive Tertiary Manu.	-.143	.003	.402	.007	.366
	(.2647)	(.2614)	(.3232)	(.2963)	(.3116)
Construction	.019	.317	.300	.177	.263
	(.3049)	(.2779)	(.3549)	(.2910)	(.3578)
Transport/Storage/Wholesale	-.186	.326	-.197	.168	-.208
	(.2655)	(.2570)	(.3664)	(.3079)	(.3093)
Communications/Utilities	-.067	.538**	-.045	.441	-.030
	(.2756)	(.2626)	(.3840)	(.2790)	(.3808)
Retail/Commercial	-.207	.318	.128	.146	.065
	(.2731)	(.2649)	(.3952)	(.3154)	(.3370)
Finance/Insurance	.641**	1.078***	.500	.991***	.475
	(.3125)	(.3094)	(.3718)	(.3640)	(.3473)
Real Estate	.001	.650**	.002	.239	-.111
	(.3320)	(.2904)	(.4693)	(.4011)	(.4032)
Business Services	.260	.649**	.387	.349	.512
	(.2838)	(.2885)	(.4049)	(.3358)	(.3462)
Education/Health Care	-.155	.563	-.390	.555	-.328
	(.3810)	(.3449)	(.5143)	(.4050)	(.4898)
Information/Cultural	-.071	.250	.337	-.039	.330
	(.3439)	(.3105)	(.4186)	(.4601)	(.3891)
Occupation					
Proportion Managers	.150	.226	.042	.256	.047
	(.3073)	(.3270)	(.4371)	(.4121)	(.4329)
Proportion Professional	1.091**	.440	.783	.839*	.798*
	(.4404)	(.3635)	(.6026)	(.4938)	(.4368)
Proportion Sales	.484	-.151	.613	-.262	.790*
	(.3591)	(.2876)	(.4870)	(.3782)	(.4475)
Proportion Administrative	.313	.046	.285	-.041	.287
	(.3435)	(.2797)	(.4133)	(.4048)	(.4339)
Proportion Technical	.668**	.633**	.555*	.564*	.525
	(.2740)	(.2590)	(.3360)	(.3117)	(.3438)
Institutional					
Proportion Covered by CBA	-.247	-.300	-.591*	-.135	-.499
	(.3401)	(.2597)	(.3133)	(.3322)	(.3559)
HR Unit	-.304	-.193	.045	-.300	.038
	(.3961)	(.2178)	(.4314)	(.2891)	(.4592)
Innovation					
Process Innovation	.617***	.279*	.782***	.341*	.782***
	(.1874)	(.1438)	(.1824)	(.1775)	(.2032)
Product Innovation	.214	.206	.148	.104	.187
	(.1698)	(.1371)	(.1775)	(.1555)	(.2037)

Turnover					
Turnover	.049	.097	-.071	.108	-.089
	(.1186)	(.0940)	(.1994)	(.1176)	(.1504)
Downsized	.223	.148	.480**	.128	.509*
	(.2348)	(.1846)	(.2328)	(.2534)	(.2659)
Firm Characteristics					
Percentage Assets Foreign held	.002	.003	.007**	.003	.007**
	(.0031)	(.0022)	(.0035)	(.0026)	(.0031)
Proportion Full-Time	-.131	.355	-.378	.255	-.508
	(.2949)	(.2515)	(.3483)	(.3630)	(.3777)
Multi-establishment	.075	.269**	-.007	.267	.020
	(.1858)	(.1370)	(.2236)	(.2117)	(.2473)
Relative 2060 Earnings	.215**	.282***	.128	.289***	.116
	(.1024)	(.0957)	(.1134)	(.1116)	(.1331)
Competition					
1-5 Competing Firms	.455	-.074	.419	-.137	.393
	(.3820)	(.3589)	(.5157)	(.3573)	(.5376)
6-20 Competing Firms	.630	-.004	.699	-.073	.699
	(.4081)	(.3632)	(.5155)	(.3930)	(.5307)
20+ Competing Firms	.471	.025	.437	-.047	.451
	(.4392)	(.3679)	(.5196)	(.3822)	(.5643)
Proportion Canada Sales	.002	.002	.001	.0002	.002
	(.0026)	(.0024)	(.0031)	(.0029)	(.0028)
Proportion USA Sales	-.004	-.001	-.004	-.001	-.004
	(.0040)	(.0030)	(.0037)	(.0044)	(.0042)
Proportion ROW Sales	-.012*	-.012**	-.005	-.007	-.006
	(.0066)	(.0053)	(.0085)	(.0059)	(.0079)
Business Strategies					
R&D Business Strategy	.063	.084*	.007	.104**	.002
	(.0470)	(.0461)	(.0540)	(.0470)	(.0595)
Organizational Business Strat.	.061	.035	.069	.054	.070
	(.0574)	(.0484)	(.0547)	(.0494)	(.0609)
Cost Control Business Strategy	.008	-.0004	-.026	-.046	-.012
	(.0873)	(.0723)	(.0880)	(.0927)	(.1033)
Region					
Atlantic	-.082	.171	-.203	.366	-.169
	(.2484)	(.1976)	(.2471)	(.2420)	(.2249)
Quebec	-.003	.195	-.478**	.091	-.444**
	(.2017)	(.1644)	(.2223)	(.2115)	(.2112)
Prairie	.026	-.214	.155	.070	.172
	(.2805)	(.2279)	(.2770)	(.2729)	(.2879)
Alberta	-.037	-.075	-.064	-.133	-.047
	(.2052)	(.1866)	(.2369)	(.1954)	(.2463)
BC	.472*	.097	.420**	.189	.405*
	(.2485)	(.2070)	(.1931)	(.2336)	(.2233)
CBA Clauses					
Technological Provisions	.227	.086	.244	-.020	.301
	(.3526)	(.3494)	(.5610)	(.4936)	(.6845)
Reorganization Provisions	.325	.577	-.411	.308	-.418
	(.4811)	(.3888)	(.6490)	(.5725)	(.6604)
Participation Provisions	.026	-.048	.283	.282	.240
	(.5551)	(.2855)	(.6910)	(.3985)	(.6046)
Health & Safety Provisions	-.571	-.517	.085	-.980**	.093
	(.4821)	(.3538)	(.5393)	(.4551)	(.4811)
Education Training Provisions	.059	.079	.057	.052	.072
	(.3545)	(.3155)	(.3686)	(.3854)	(.4298)

Work Organization Flexible Job Design Problem Solving Teams Labour-Management Comm. Self-Directed Work Groups Constant	-2.744*** (.5584)	-3.228*** (.5142)	-2.801*** (.6727)	-3.207*** (.5443)	-2.770*** (.6670)
Rho	----- -----	----- -----	----- -----	.563*** (.0615)	
Number of Observations Log Likelihood Pseudo R^2	3272 -166939.03 0.2893	3610 -187853.39 0.2358	2590 -129121.87 0.3113	2537 -236781.13 -----	

Source: WES 2002, author's calculations. Standard errors are in parenthesis. * denotes statistically significant at a 90% level of confidence. ** denotes statistically significant at a 95% level of confidence. *** denotes statistically significant at a 99% level of confidence.

Table 7
Employer Provided Training Probit Estimates 2002

Variable	Probit	Independent Probit		Bivariate Probit	
	Training Probit	Classroom Probit	OTJ Probit	Classroom Probit	OTJ Probit
Ln(Firm Size)	.255*	.370**	.164	.382*	.236
	(.1537)	(.1529)	(.1658)	(.2114)	(.2250)
Industry					
Forestry/Mining	-.458	.136	-.060	-.489	.052
	(.7813)	(.4802)	(.6059)	(.6768)	(.5908)
Labor Intensive Tertiary Manu.	-.550	-.351	-.337	-.647**	-.300
	(.3708)	(.3044)	(.4174)	(.3139)	(.3561)
Secondary Manufacturing	-.159	-.137	.360	.118	.356
	(.3930)	(.3177)	(.4025)	(.3719)	(.3904)
Capital Intensive Tertiary Manu.	.105	-.060	.638*	-.098	.611*
	(.4007)	(.3170)	(.3662)	(.3923)	(.3462)
Construction	-.164	-.038	.798	.233	.717
	(.5983)	(.3699)	(.4886)	(.4419)	(.5247)
Transport/Storage/Wholesale	-.471	-.080	-.169	-.187	-.087
	(.4047)	(.2890)	(.3673)	(.4159)	(.3495)
Communications/Utilities	-.188	.376	.052	.379	.165
	(.5069)	(.3410)	(.4323)	(.5090)	(.4654)
Retail/Commercial	-.186	.074	.359	.257	.443
	(.5132)	(.3838)	(.4862)	(.4739)	(.4672)
Finance/Insurance	-.175	.514	.266	.524	.214
	(.5320)	(.4128)	(.5274)	(.6702)	(.5286)
Real Estate	-.425	.150	-.227	-.321	-.252
	(.7389)	(.5764)	(.5648)	(.6796)	(.5938)
Business Services	.0006	.106	.698	.044	.722
	(.5123)	(.3386)	(.4676)	(.4512)	(.4477)
Education/Health Care	-.538	-.244	.705	.274	.804
	(.6880)	(.4958)	(.7312)	(1.0843)	(.8653)
Information/Cultural	-.836	-.269	.095	-.351	.181
	(.5144)	(.4534)	(.4258)	(.5810)	(.4527)
Occupation					
Proportion Managers	.103	-.079	.139	.112	.239
	(.5803)	(.5440)	(.7704)	(.6790)	(.7379)
Proportion Professional	1.817**	1.861***	.246	2.091***	.371
	(.7687)	(.6109)	(.7940)	(.7032)	(.8468)
Proportion Sales	.588	.289	.454	-.079	.489
	(.6568)	(.4730)	(.7606)	(.6293)	(.7677)
Proportion Administrative	.269	-.337	.589	-.572	.754
	(.6814)	(.5249)	(.7738)	(.6774)	(.7224)
Proportion Technical	.328	.391	.071	.295	.103
	(.4987)	(.3950)	(.4675)	(.5678)	(.5097)
Institutional					
Proportion Covered by CBA	-.216	-.354	-.215	.216	-.224
	(.3854)	(.2795)	(.3579)	(.3985)	(.3600)
HR Unit	-.213	.006	.012	-.193	-.089
	(.3764)	(.2584)	(.4053)	(.3970)	(.4050)
Innovation					
Process Innovation	.164	-.069	.421	.197	.412
	(.2759)	(.2277)	(.2902)	(.2430)	(.2662)
Product Innovation	.413*	.387**	.337	.205	.357
	(.2381)	(.1938)	(.2283)	(.2411)	(.2520)

Turnover					
Turnover	.330*	.096	.195	.322*	.110
	(.1933)	(.1103)	(.2545)	(.1813)	(.1964)
Downsized	.365	.131	.401	.072	.415
	(.2491)	(.2137)	(.2465)	(.2591)	(.2720)
Firm Characteristics					
Percentage Assets Foreign held	.002	.003	.005	.005	.005
	(.0054)	(.0034)	(.0042)	(.0035)	(.0047)
Proportion Full-Time	.079	.436	-.023	.943	-.036
	(.5841)	(.5114)	(.6649)	(.6605)	(.6152)
Multi-establishment	.153	.316*	.017	.410*	.003
	(.2768)	(.1679)	(.2579)	(.2359)	(.2680)
Relative 2060 Earnings	.186	.307*	-.174	.311	-.196
	(.1922)	(.1647)	(.2056)	(.2050)	(.2392)
Competition					
1-5 Competing Firms	.252	-.398	.196	-.531	.104
	(.6848)	(.7541)	(.6728)	(.9244)	(.9277)
6-20 Competing Firms	.516	-.383	.628	-.423	.586
	(.7056)	(.7760)	(.6755)	(.9111)	(.9246)
20+ Competing Firms	.644	-.352	.638	-.165	.558
	(.7605)	(.7816)	(.7206)	(.9546)	(.9579)
Proportion Canada Sales	-.0003	-.0004	.003	-.001	.004
	(.0032)	(.0025)	(.0033)	(.0030)	(.0033)
Proportion USA Sales	-.004	-.003	-.002	-.004	-.001
	(.0042)	(.0037)	(.0041)	(.0048)	(.0045)
Proportion ROW Sales	.001	-.010	.002	.001	.002
	(.0118)	(.0094)	(.0098)	(.0105)	(.0084)
Business Strategies					
R&D Business Strategy	-.125	.002	-.105	.005	-.073
	(.0892)	(.0716)	(.0955)	(.0910)	(.0748)
Organizational Business Strat.	.188**	.061	.123	.053	.100
	(.0940)	(.0704)	(.0867)	(.0808)	(.0855)
Cost Control Business Strategy	.011	-.014	.037	.013	.088
	(.1666)	(.1118)	(.1704)	(.1903)	(.1492)
Region					
Atlantic	-.032	-.255	-.083	-.243	-.018
	(.3064)	(.2874)	(.3580)	(.3098)	(.3683)
Quebec	.697**	.316	.027	.406	.048
	(.2767)	(.2529)	(.3353)	(.3286)	(.3026)
Prairie	.091	-.566*	.241	-.107	.314
	(.4819)	(.2991)	(.5138)	(.3759)	(.5099)
Alberta	.061	-.251	.182	-.076	.179
	(.3030)	(.2443)	(.3936)	(.3158)	(.3636)
BC	.381	-.010	.386	.218	.372
	(.3044)	(.2683)	(.3567)	(.2982)	(.3733)
CBA Clauses					
Technological Provisions	-.022	-.191	.132	-.404	.138
	(.3337)	(.3325)	(.4857)	(.3982)	(.5303)
Reorganization Provisions	.360	.491	-.399	.207	-.373
	(.3964)	(.4157)	(.6173)	(.5367)	(.7333)
Participation Provisions	.345	.318	.479	.854*	.449
	(.3334)	(.3988)	(.4932)	(.4645)	(.4753)
Health & Safety Provisions	.143	-.035	.310	-.735	.340
	(.5759)	(.3658)	(.6131)	(.4537)	(.5944)
Education Training Provisions	-.077	.060	.004	-.154	.071
	(.4171)	(.3447)	(.4473)	(.4750)	(.3995)

Work Organization					
Flexible Job Design	.152	-.067	.068	.003	.059
	(.3346)	(.2095)	(.2955)	(.2637)	(.2414)
Problem Solving Teams	.434	.455**	.765***	.760**	.795***
	(.2791)	(.2173)	(.2606)	(.3113)	(.2907)
Labour-Management Comm.	.084	.095	.019	-.054	-.084
	(.3172)	(.2199)	(.2491)	(.2591)	(.2655)
Self-Directed Work Groups	-.233	-.257	-.085	-.501	-.040
	(.3813)	(.2914)	(.3429)	(.3674)	(.3888)
Constant	-1.81	-2.109**	-1.971**	-2.934**	-2.408*
	(1.2197)	(1.0567)	(.9799)	(1.3379)	(1.2847)
Rho	-----	-----	-----	.598***	
	-----	-----	-----	(.0958)	
Number of Observations	2471	2657	1873	1833	
Log Likelihood	-47595.46	-72024.41	-48607.07	-87931.25	
Pseudo R^2	0.2080	0.2065	0.2030	-----	

Source: WES 2002, author's calculations. Standard errors are in parenthesis. * denotes statistically significant at a 90% level of confidence. ** denotes statistically significant at a 95% level of confidence. *** denotes statistically significant at a 99% level of confidence.

Table 8
Change in Marginal Probabilities of Employer Provided Training: 2002

	Probit	Independent Probit		Bivariate Probit	
Discrete Variables	Training	Classroom	OTJ	Classroom	OTJ
Forestry/Mining	.0377	.0337	.0212	-.0376	.0351
Labor Intensive Tertiary Manu.	-.0819	-.1122	-.0687	-.0894	-.0590
Primary Manufacturing	.0157	-.0995	-.0345	-.0550	-.0301
Secondary Manufacturing	-.0407	-.1103	.0453	-.0724	.0625
Capital Intensive Tertiary Manu.	-.0251	-.0986	.0675	-.0535	.0618
Construction	.0214	-.0225	.0405	-.0154	.0348
Transport/Storage/Wholesale	-.0371	-.0203	-.0789	-.0177	-.0769
Communications/Utilities	-.0033*	.0379	-.0452	.0498	-.0371
Retail/Commercial	-.0430	-.0223	-.0034*	-.0226	-.0147
Finance/Insurance	.1939	.2004	.0944	.2046	.0909
Real Estate	.0162	.0701	-.0338	-.0010*	-.0556
Business Services	.0898	.0698	.0636	.0262	.1011
Education/Health Care	-.0283	.0449	-.1184	.0802	-.1017
Information/Cultural	-.0046*	-.0399	.0502	-.0632	.0521
No Innovation	-.0594	-.0401	-.0626	-.0307	-.0662
Process Innovation Only	.1234	.0364	.1568	.0542	.1496
Product Innovation Only	.0043*	.0156	-.0254	-.0060	-.0195
Process & Product Innovation	.1839	.0977	.2019	.0828	.2061
Continuous Variables					
Ln(Firm Size)	.1527	.1262	.1433	.1368	.1398
Proportion Managers	.0004	.0006	.0001	.0006	.0001
Proportion Professional	.0030	.0011	.0019	.0019	.0019
Proportion Sales	.0013	-.0004	.0014	-.0006	.0019
Proportion Administrative	.0008	.0001	.0006	-.00009	.0006
Proportion Technical	.0018	.0016	.0013	.0013	.0012
Turnover	.0001	.0002	-.0001	.0002	-.0002
Proportion Full-Time	-.0003	.0009	-.0009	.0006	-.0012
Proportion Canada Sales	.0006	.0006	.0003	.0000005	.000004
Proportion USA Sales	-.0013	-.0004	-.0011	-.000004	-.00001
Proportion ROW Sales	-.0035	-.0032	-.0013	-.00001	-.00001
Proportion Covered by CBA	-.0006	-.0008	-.0014	-.0003	-.0011
CBA Clauses					
No Technological Provisions	-.0014	-.0007	-.0014	.0001	-.0018
Technological Provisions	.0060	.0026	.0059	-.0005	.0073
No Reorganization Provisions	-.0020	-.0048	.0023	-.0016	.0024
Reorganization Provisions	.0086	.0176	-.0093	.0089	-.0094
No Participation Provisions	-.0001	.0004	-.0015	-.0015	-.0013
Participation Provisions	.0006	-.0014	.0071	.0081	.0059
No Health & Safety Provisions	.0016	.0016	-.0002	.0024	-.0002
Health & Safety Provisions	-.0174	-.0174	.0023	-.0268	.0025
No Educ. Training Provisions	-.0003	-.0005	-.0002	-.0002	-.0003
Education Training Provisions	.0016	.0025	.0014	.0015	.0017

Source: WES 1999-2002, author's calculations. Marginal effects were calculated for every observation and the sample average of the individual effects is reported. * denotes *not* statistically significant at a 95% level of confidence.

Table 9
Change in Conditional Probabilities of Employer Provided Training: 2002

	Independent Probit		Bivariate Probit	
Discrete Variables	Classroom | OTJ	OTJ | Classroom	Classroom | OTJ	OTJ | Classroom
Forestry/Mining	.0320	.0226	-.0772	.0758
Labor Intensive Tertiary Manu.	-.1094	-.0672	-.1105	-.0208
Primary Manufacturing	-.0973	-.0330	-.0684	-.0037*
Secondary Manufacturing	-.1076	.0466	-.1459	.1363
Capital Intensive Tertiary Manu.	-.0964	.0688	-.1155	.1214
Construction	-.0229	.0419	-.0425	.0604
Transport/Storage/Wholesale	-.0207	-.0774	.0261	-.1026
Communications/Utilities	.0361	-.0437	.0996	-.0808
Retail/Commercial	-.0226	-.0021*	-.0248	-.0039*
Finance/Insurance	.1970	.0957	.2191	.0184
Real Estate	.0677	-.0324	.0369	-.0794
Business Services	.0674	.0649	-.0147	.1186
Education/Health Care	.0429	-.1168	.1896	-.1939
Information/Cultural	-.0397	.0515	-.1266	.1164
No Innovation	-.0382	-.0630	-.0089	-.0576
Process Innovation Only	.0371	.1561	.0023	.1659
Product Innovation Only	.0166	-.0259	.0004*	-.0055*
Process & Product Innovation	.0979	.2012	.0164	.2094
Continuous Variables				
Ln(Firm Size)	.1240	.1430	.1130	.1056
Proportion Managers	.0005	.0001	.0008	-.0002
Proportion Professional	.0011	.0019	.0018	.0014
Proportion Sales	-.0003	.0014	-.0021	.0030
Proportion Administrative	.0001	.0006	-.0005	.0010
Proportion Technical	.0016	.0013	.0012	.0009
Turnover	.0002	-.0001	.0005	-.0004
Proportion Full-Time	.0009	-.0009	.0016	-.0021
Proportion Canada Sales	.0006	.0003	-.000002	.000006
Proportion USA Sales	-.0004	-.0011	-.0000001	-.00001
Proportion ROW Sales	-.0032	-.0013	-.00001	-.00001
Proportion Covered by CBA	-.0007	-.0014	.00024	-.00150
CBA Clauses				
No Technological Provisions	-.0005	-.0015	.0008	-.0021
Technological Provisions	.0025	.0060	-.0051	.0103
No Reorganization Provisions	-.0033	.0024	-.0025	.0031
Reorganization Provisions	.0172	-.0093	.0164	-.0168
No Participation Provisions	.0002	-.0015	-.0011	-.0008
Participation Provisions	-.0013	.0071	.0064	.0044
No Health & Safety Provisions	.0014	-.0002	.0031	-.0015
Health & Safety Provisions	-.0158	.0023	-.0402	.0193
No Educ. Training Provisions	-.0004	-.0002	-.0001	-.0002
Education Training Provisions	.0023	.0014	.0008	.0017

Source: WES 1999-2002, author's calculations. Marginal effects were calculated for every observation and the sample average of the individual effects is reported. * denotes *not* statistically significant at a 95% level of confidence.

Table 10
Change in Joint Probabilities of Employer Provided Training: 2002

	Independent Probit			
Discrete Variables	Classroom & OTJ	Classroom Only	OTJ Only	No Training
Forestry/Mining	.0188	.0131	.0037*	-.0357
Labor Intensive Tertiary Manu.	-.0610	-.0484	-.0061	.1156
Primary Manufacturing	-.0481	-.0491	.0150	.0822
Secondary Manufacturing	-.0348	-.0728	.0814	.0261
Capital Intensive Tertiary Manu.	-.0247	-.0717	.0935	.0029*
Construction	.0028*	-.0257	.0390	-.0161
Transport/Storage/Wholesale	-.0352	.0145	-.0421	.0628
Communications/Utilities	-.0052	.0414	-.0384	.0023*
Retail/Commercial	-.0105	-.0120	.0084	.0141
Finance/Insurance	.1150	.0820	-.0193	-.1777
Real Estate	.0092	.0585	-.0416	-.0261
Business Services	.0489	.0185	.0159	-.0834
Education/Health Care	-.0348	.0777	-.0820	.0390
Information/Cultural	-.0017*	-.0379	.0533	-.0135
No Innovation	-.0450	.0067	-.0180	.0562
Process Innovation Only	.0566	-.0195	.0994	-.1365
Product Innovation Only	-.0148	.0314	-.0110	-.0055*
Process & Product Innovation	.1047	-.0068	.0964	-.1944
Continuous Variables				
Ln(Firm Size)	.1068	.0172	.0362	-.1602
Proportion Managers	.0002	.0003	-.0001	-.0004
Proportion Professional	.0010	.00006*	.0008	-.0019
Proportion Sales	.0003	-.0007	.0011	-.0007
Proportion Administrative	.0002	-.0001	.0004	-.0005
Proportion Technical	.0010	.0005	.0002	-.0019
Turnover	.00003	.0002	-.0002	-.00004
Proportion Full-Time	.00003	.0008	-.0009	.00002*
Proportion Canada Sales	.0003	.0003	-.00004	-.0006
Proportion USA Sales	-.0005	.0001	-.0005	.0009
Proportion ROW Sales	-.0016	-.0015	.0003	.0028
Proportion Covered by CBA	-.0007	.000002*	-.0006	.0014
CBA Clauses				
No Technological Provisions	-.0011	.0005	-.0003	.0009
Technological Provisions	.0038	-.0013	.0021	-.0047
No Reorganization Provisions	-.0006	-.0027	.0030	.0002*
Reorganization Provisions	-.0003*	.0176	-.0090	-.0082
No Participation Provisions	-.0007	.0010	-.0007	.0004
Participation Provisions	.0026	-.0040	.0045	-.0031
No Health & Safety Provisions	.0004	.0009	-.0006	-.0007
Health & Safety Provisions	-.0061	-.0096	.0084	.0073
No Educ. Training Provisions	-.0003	-.00005*	.00005	.0003
Education Training Provisions	.0016	.0007	-.0001*	-.0021

Source: WES 1999-2002, author's calculations. Marginal effects were calculated for every observation and the sample average of the individual effects is reported. * denotes *not* statistically significant at a 95% level of confidence.

Table 11
Change in Joint Probabilities of Employer Provided Training: 2002

	Bivariate Probit			
Discrete Variables	Classroom & OTJ	Classroom Only	OTJ Only	No Training
Forestry/Mining	-.0084	-.0291	.0436	-.0059
Labor Intensive Tertiary Manu.	-.0597	-.0297	.0007*	.0887
Primary Manufacturing	-.0351	-.0198	.0049	.0500
Secondary Manufacturing	-.0236	-.0487	.0861	-.0137
Capital Intensive Tertiary Manu.	-.0117	-.0417	.0735	-.0200
Construction	.0036	-.0191	.0312	-.0157
Transport/Storage/Wholesale	-.0349	.0172	-.0419	.0596
Communications/Utilities	.0062	.0435	-.0434	-.0063
Retail/Commercial	-.0149	-.0077	.0002*	.0224
Finance/Insurance	.1280	.0766	-.0371	-.1675
Real Estate	-.0203	.0193	-.0352	.0363
Business Services	.0459	-.0197	.0551	-.0814
Education/Health Care	-.0180	.0982	-.0836	.0034*
Information/Cultural	-.0198	-.0434	.0719	-.0086
No Innovation	-.0425	.0118	-.0237	.0544
Process Innovation Only	.0698	-.0156	.0797	-.1339
Product Innovation Only	-.0159	.0098	-.0036*	.0096*
Process & Product Innovation	.1043	-.0215	.1017	-.1845
Continuous Variables				
Ln(Firm Size)	.1195	.0172	.0202	-.1571
Proportion Managers	.0003	.0002	-.0002	-.0003
Proportion Professional	.0015	.0004	.0003	-.0023
Proportion Sales	.0003	-.0009	.0015	-.0009
Proportion Administrative	.0001	-.0002	.0005	-.0004
Proportion Technical	.0010	.0002	.0002	-.0015
Turnover	.00004	.0002	-.0002	.000006*
Proportion Full-Time	-.0001	.0007	-.0010	.0004
Proportion Canada Sales	.000001	-.000001	.000003	-.000003
Proportion USA Sales	-.000005	.000001	-.000004	.000008
Proportion ROW Sales	-.00001	-.000003	-.000002	.00001
Proportion Covered by CBA	-.00055	.00023	-.00064	.00096
CBA Clauses				
No Technological Provisions	-.0009	.0010	-.0008	.0007
Technological Provisions	.0031	-.0037	.0041	-.0035
No Reorganization Provisions	.0001*	-.0017	.0022	-.0006
Reorganization Provisions	-.0033	.0123	-.0060	-.0028
No Participation Provisions	-.0014	-.00008*	.0001*	.0013
Participation Provisions	.0063	.0017	-.0003*	-.0077
No Health & Safety Provisions	.0009	.0014	-.0012	-.0011
Health & Safety Provisions	-.0137	-.0130	.0163	.0104
No Educ. Training Provisions	-.0002	.00005	-.00006*	.0003
Education Training Provisions	.0015	-.00001*	.0002	-.0017

Source: WES 1999-2002, author's calculations. Marginal effects were calculated for every observation and the sample average of the individual effects is reported. * denotes *not* statistically significant at a 95% level of confidence.

Table 12
Change in Marginal Probabilities of Employer Provided Training: 2002

	Probit	Independent Probit		Bivariate Probit	
Discrete Variables	Training	Classroom	OTJ	Classroom	OTJ
Forestry/Mining	-.0546	.0361	-.1186	-.1688	-.0938
Labor Intensive Tertiary Manu.	-.0798	-.1162	-.2058	-.2114	-.2035
Primary Manufacturing	.0538	-.0068	-.0994	-.0261	-.1104
Secondary Manufacturing	.0196	-.0500	.0145	.0093	.0015*
Capital Intensive Tertiary Manu.	.0745	-.0259	.0970	-.055	.0776
Construction	.0185	-.0189	.1406	.0439	.1077
Transport/Storage/Wholesale	-.0582	-.0321	-.1535	-.0821	-.1378
Communications/Utilities	.0130	.1098	-.0826	.0871	-.0581
Retail/Commercial	.0134	.0166	.0142	.0511	.0278
Finance/Insurance	.0158	.1507	-.0147	.1287	-.0427
Real Estate	-.0458	.0405	-.1717	-.1214	-.1889
Business Services	.0540	.0265	.1137	-.0127	.1090
Education/Health Care	-.0765	-.0835	.1156	.0562	.1312
Information/Cultural	-.1639	-.0910	-.0690	-.1301	-.0531
No Innovation	-.0494	-.0411	-.0796	-.0451	-.0818
Process Innovation Only	-.0065*	-.0631	.0554	.0140	.0500
Product Innovation Only	.0508	.0817	.0295	.0166	.0331
Process & Product Innovation	.0833	.0599	.1516	.0754	.1524
Continuous Variables					
Ln(Firm Size)	.0558	.1140	.0487	.1109	.0690
Proportion Managers	.0002	-.0002	.0004	.0003	.0007
Proportion Professional	.0042	.0058	.0007	.0061	.0011
Proportion Sales	.0013	.0009	.0013	-.0002	.0014
Proportion Administrative	.0006	-.0010	.0017	-.0016	.0022
Proportion Technical	.0007	.0012	.0002	.0008	.0003
Turnover	.0007	.0003	.0005	.0009	.0003
Proportion Full-Time	.0001	.0013	-.00007	.0027	-.0001
Proportion Canada Sales	-.00007	-.0001	.0011	-.000003	.00001
Proportion USA Sales	-.0010	-.0009	-.0006	-.00001	-.000005
Proportion ROW Sales	.0004	-.0033	.0008	.000005	.000007
Proportion Covered by CBA	-.0005	-.0011	-.0006	.0006	-.0006
CBA Clauses					
No Technological Provisions	.0002	.0037	-.0021	.0057	-.0022
Technological Provisions	-.0008	-.0098	.0059	-.0179	.0060
No Reorganization Provisions	-.0047	-.0102	.0058	-.0028	.0054
Reorganization Provisions	.0128	.0244	-.0186	.0092	-.0167
No Participation Provisions	-.0046	-.0072	-.0077	-.0123	-.0072
Participation Provisions	.0123	.0156	.0210	.0349	.0193
No Health & Safety Provisions	-.0007	.0002	-.0017	.0038	-.0019
Health & Safety Provisions	.0063	-.0022	.0167	-.0397	.0178
No Educ. Training Provisions	.0008	-.0010	-.00005	.0018	-.0009
Education Training Provisions	-.0031	.0032	.0002	-.0072	.0033
Work Organization Practices					
No Flexible Job Design	-.0049	.0036	-.0026	-.0001	-.0022
Flexible Job Design	.0300	-.0174	.0179	.0008	.0153
No Problem Solving Teams	-.0183	-.0286	-.0423	-.0482	-.0446

Problem Solving Teams	.0769	.1147	.1775	.1752	.1823
No Lab.-Man. Committees	-.0022	-.0037	-.0006	.0020	.0026
Labour-Management Committees	.0173	.0260	.0051	-.0138	-.0228
No Self-Directed Work Groups	.0031	.0060	.0014	.0130	.0006
Self-Directed Work Groups	-.0551	-.0740	-.0246	-.1313	-.0114

Source: WES 1999-2002, author's calculations. Marginal effects were calculated for every observation and the sample average of the individual effects is reported. * denotes *not* statistically significant at a 95% level of confidence.

Table 13
Change in Conditional Probabilities of Employer Provided Training: 2002

	Independent Probit		Bivariate Probit	
Discrete Variables	Classroom | OTJ	OTJ | Classroom	Classroom | OTJ	OTJ | Classroom
Forestry/Mining	.0332	-.1183	-.1543	-.0166
Labor Intensive Tertiary Manu.	-.1197	-.2058	-.1616	-.1053
Primary Manufacturing	-.0096	-.0990	.0155	-.0955
Secondary Manufacturing	-.0530	.0155	.0109	-.0010*
Capital Intensive Tertiary Manu.	-.0288	.0982	-.0860	.0828
Construction	-.0218	.1420	.0103	.0776
Transport/Storage/Wholesale	-.0350	-.1533	-.0340	-.0998
Communications/Utilities	.1066	-.0820	.1082	-.0865
Retail/Commercial	.0138	.0151	.0445	.0083*
Finance/Insurance	.1472	-.0139	.1409	-.0863
Real Estate	.0377	-.1715	-.0566	-.1367
Business Services	.0237	.1151	-.0499	.0939
Education/Health Care	-.0867	.1170	.0153	.0925
Information/Cultural	-.0942	-.0684	-.1235	.0031*
No Innovation	-.0413	-.0803	-.0177	-.0569
Process Innovation Only	-.0635	.0549	-.0016*	.0413
Product Innovation Only	.0814	.0289	.0068	.0260
Process & Product Innovation	.0597	.1512	.0282	.1057
Continuous Variables				
Ln(Firm Size)	.1135	.0488	.0899	.0257
Proportion Managers	-.0002	.0004	.00009	.0005
Proportion Professional	.0058	.0007	.0061	-.0011
Proportion Sales	.0009	.0013	-.0007	.0014
Proportion Administrative	-.0010	.0017	-.0026	.0026
Proportion Technical	.0012	.0002	.0008	-.00002
Turnover	.0003	.0005	.0008	-.00003
Proportion Full-Time	.0013	-.00007	.0030	-.0011
Proportion Canada Sales	-.0001	.0011	-.000009	.00001
Proportion USA Sales	-.0009	-.0006	-.00001	-.0000003
Proportion ROW Sales	-.0033	.0008	.000003	.000004
Proportion Covered by CBA	-.0011	-.0006	.0009	-.0008
CBA Clauses				
No Technological Provisions	.0028	-.0021	.0059	-.0041
Technological Provisions	-.0092	.0059	-.0218	.0130
No Reorganization Provisions	-.0071	.0058	-.0043	.0052
Reorganization Provisions	.0233	-.0185	.0144	-.0220
No Participation Provisions	-.0047	-.0077	-.0099	-.0021
Participation Provisions	.0153	.0211	.0240	.0079
No Health & Safety Provisions	.0001	-.0018	.0042	-.0034
Health & Safety Provisions	-.0020	.0167	-.0514	.0303
No Educ. Training Provisions	-.0007	-.00006	.0019	-.0015
Education Training Provisions	.0030	.0002	-.0087	.0061
Work Organization Practices				

No Flexible Job Design	.0031	-.0026	.0006	-.0017
Flexible Job Design	-.0179	.0179	-.0047	.0139
No Problem Solving Teams	-.0306	-.0427	-.0334	-.0248
Problem Solving Teams	.1121	.1774	.1176	.1028
No Lab.-Man. Committees	-.0038	-.0006	.0011	.0017
Labour-Management Committees	.0259	.0052	-.0066	-.0161
No Self-Directed Work Groups	.0068	.0014	.0129	-.0020
Self-Directed Work Groups	-.0735	-.0246	-.1458	.0413

Source: WES 1999-2002, author's calculations. Marginal effects were calculated for every observation and the sample average of the individual effects is reported. * denotes *not* statistically significant at a 95% level of confidence.

Table 14
Change in Joint Probabilities of Employer Provided Training: 2002

	Independent Probit			
Discrete Variables	Classroom & OTJ	Classroom Only	OTJ Only	No Training
Forestry/Mining	-.0501	.0834	-.0681	.0348
Labor Intensive Tertiary Manu.	-.1610	.0412	-.0447	.1645
Primary Manufacturing	-.0606	.0509	-.0383	.0480
Secondary Manufacturing	-.0290	-.0240	.0445	.0085
Capital Intensive Tertiary Manu.	.0255	-.0543	.0727	-.0438
Construction	.0512	-.0730	.0908	-.0689
Transport/Storage/Wholesale	-.1003	.0653	-.0529	.0879
Communications/Utilities	.0072*	.0994	-.0893	-.0173
Retail/Commercial	.0121	.0017*	.0030*	-.0168
Finance/Insurance	.0730	.0741	-.0869	-.0602
Real Estate	-.0786	.1164	-.0929	.0551
Business Services	.0710	-.0473	.0440	-.0677
Education/Health Care	-.0076*	-.0790	.1246	-.0379
Information/Cultural	-.0903	-.0039*	.0218	.0724
No Innovation	-.0716	.0303	-.0086	.0500
Process Innovation Only	-.0208	-.0427	.0757	-.0121
Product Innovation Only	.0584	.0230	-.0294	-.0520
Process & Product Innovation	.1150	-.0552	.0362	-.0960
Continuous Variables				
Ln(Firm Size)	.0978	.0156	-.0490	-.0645
Proportion Managers	.00006	-.0003	.0003	-.0001
Proportion Professional	.0038	.0019	-.0031	-.0026
Proportion Sales	.0012	-.0003	.0001	-.0010
Proportion Administrative	.0002	-.0013	.0015	-.0004
Proportion Technical	.0008	.0003	-.0006	-.0005
Turnover	.0004	-.0001	.0001	-.0004
Proportion Full-Time	.0007	.0005	-.0008	-.0005
Proportion Canada Sales	.0004	-.0006	.0006	-.0004
Proportion USA Sales	-.0009	-.00006	.0002	.0007
Proportion ROW Sales	-.0016	-.0017	.0024	.0009
Proportion Covered by CBA	-.0010	-.0001	.0003	.0007
CBA Clauses				
No Technological Provisions	.0003*	.0025	-.0024	-.0003
Technological Provisions	-.0023	-.0069	.0082	.0009
No Reorganization Provisions	-.0014	-.0056	.0072	-.0001*
Reorganization Provisions	-.0005*	.0238	-.0180	-.0052
No Participation Provisions	-.0079	.0031	.0001*	.0045
Participation Provisions	.0210	-.0057	.00002*	-.0153
No Health & Safety Provisions	-.0011	.0013	-.0006	.0004
Health & Safety Provisions	.0077	-.0097	.0090	-.0069
No Educ. Training Provisions	-.0004	-.0002	.0004	.0003
Education Training Provisions	.0018	.0012	-.0016	-.0014
Work Organization Practices				

No Flexible Job Design	.0009	.0022	-.0036	.0004
Flexible Job Design	-.0014	-.0164	.0194	-.0015
No Problem Solving Teams	-.0471	.0165	.0043	.0262
Problem Solving Teams	.1702	-.0580	.0072*	-.1193
No Lab.-Man. Committees	-.0031	-.0006	.0025	.0012
Labour-Management Committees	.0178	.0081	-.0126	-.0133
No Self-Directed Work Groups	.0062	.0005*	-.0048	-.0019
Self-Directed Work Groups	-.0541	-.0193	.0295	.0439

Source: WES 1999-2002, author's calculations. Marginal effects were calculated for every observation and the sample average of the individual effects is reported. * denotes *not* statistically significant at a 95% level of confidence.

Table 15
Change in Joint Probabilities of Employer Provided Training: 2002

	Bivariate Probit			
Discrete Variables	Classroom & OTJ	Classroom Only	OTJ Only	No Training
Forestry/Mining	-.1423	-.0265	.0484	.1204
Labor Intensive Tertiary Manu.	-.2013	-.0101	-.0022*	.2136
Primary Manufacturing	-.0705	.0444	-.0398	.0660
Secondary Manufacturing	.0025*	.0068	-.0010*	-.0083*
Capital Intensive Tertiary Manu.	-.0104	-.0453	.0881	-.0323
Construction	.0729	-.0289	.0348	-.0788
Transport/Storage/Wholesale	-.1110	.0289	-.0267	.1088
Communications/Utilities	.0128	.0742	-.0709	-.0161
Retail/Commercial	.0404	.0106	-.0126	-.0385
Finance/Insurance	.0420	.0867	-.0847	-.0440
Real Estate	-.1522	.0308	-.0366	.1581
Business Services	.0322	-.0450	.0767	-.0639
Education/Health Care	.0919	-.0356	.0392	-.0955
Information/Cultural	-.1051	-.0249	.0520	.0780
No Innovation	-.0686	.0235	-.0132	.0583
Process Innovation Only	.0270	-.0129	.0229	-.0370
Product Innovation Only	.0209	-.0043*	.0121	-.0287
Process & Product Innovation	.1159	-.0405	.0364	-.1118
Continuous Variables				
Ln(Firm Size)	.1031	.0078	-.0340	-.0769
Proportion Managers	.0005	-.0001	.0001	-.0005
Proportion Professional	.0042	.0018	-.0031	-.0029
Proportion Sales	.0005	-.0007	.0009	-.0007
Proportion Administrative	-.00001*	-.0016	.0022	-.0005
Proportion Technical	.0006	.0001	-.0003	-.0005
Turnover	.0007	.0002	-.0004	-.0005
Proportion Full-Time	.0016	.0011	-.0017	-.0010
Proportion Canada Sales	.000003	-.000007	.000009	-.000005
Proportion USA Sales	-.00001	-.000002	.000004	.000007
Proportion ROW Sales	.000006	-.000001	.0000004	-.000006
Proportion Covered by CBA	.00008	.0005	-.0007	.0001
CBA Clauses				
No Technological Provisions	.0017	.0040	-.0040	-.0017
Technological Provisions	-.0069	-.0110	.0129	.0049
No Reorganization Provisions	.0008*	-.0037	.0045	-.0017
Reorganization Provisions	-.0074	.0167	-.0092	.00002*
No Participation Provisions	-.0110	-.0012	.0038	.0084
Participation Provisions	.0293	.0056	-.0099	-.0250
No Health & Safety Provisions	.0008	.0029	-.0028	-.0010
Health & Safety Provisions	-.0183	-.0214	.0361	.0035
No Educ. Training Provisions	.0004	.0014	-.0013	-.0004
Education Training Provisions	-.0020	-.0052	.0053	.0019
Work Organization Practices				

No Flexible Job Design	-.0010	.0008	-.0012	.0014
Flexible Job Design	.0075	-.0067	.0078	-.0086
No Problem Solving Teams	-.0549	.0067	.0103	.0379
Problem Solving Teams	.2030	-.0277	-.0207	-.1545
No Lab.-Man. Committees	.0028	-.0007	-.0002*	-.0018
Labour-Management Committees	-.0184	.0045	-.0044	.0183
No Self-Directed Work Groups	.0104	.0025	-.0098	-.0032
Self-Directed Work Groups	-.0879	-.0434	.0764	.0549

Source: WES 1999-2002, author's calculations. Marginal effects were calculated for every observation and the sample average of the individual effects is reported. * denotes *not* statistically significant at a 95% level of confidence.

Table 16
Two-Step Selection Corrected Employer Provided Training Expenditure per Employee Estimates 2002

Variable	Two-Step Selection Correction			
	Probit	Independent Probit		
	Training Expenditure	Classroom Expenditure	OTJ Expenditure	Classroom & OTJ Expenditure
Ln(Firm Size)	-.002	-.322	-.211	-.306**
	(.1434)	(.6330)	(.7078)	(.1349)
Industry				
Forestry/Mining	.766*	1.327	.474	.721*
	(.4655)	(1.0052)	(1.9895)	(.4212)
Labor Intensive Tertiary Manu.	-.009	.109	-.453	-.519
	(.3610)	(1.0573)	(.8759)	(.3894)
Secondary Manufacturing	.596	-1.351	1.423	.924***
	(.3816)	(1.1096)	(1.4866)	(.3118)
Capital Intensive Tertiary Manu.	.046	-.717	-.889	.846**
	(.4490)	(1.0715)	(.8770)	(.3614)
Construction	.320	-.948	.842	1.208***
	(.4708)	(1.1778)	(.9455)	(.3539)
Transport/Storage/Wholesale	.141	-.730	-.281	.495
	(.3627)	(.8928)	(.9470)	(.3656)
Communications/Utilities	.898**	.333	-1.583	.481
	(.3540)	(1.1023)	(1.6265)	(.4956)
Retail/Commercial	.407	.646	-.180	.678
	(.4078)	(1.0623)	(.9490)	(.4247)
Finance/Insurance	1.037**	-.476	.111	.716
	(.4719)	(1.5712)	(1.6260)	(.5200)
Real Estate	1.160**	-.139	-.785	.473
	(.4820)	(1.3103)	(1.1343)	(.5239)
Business Services	.889**	.661	-.069	.877**
	(.4119)	(1.2702)	(1.2477)	(.3865)
Education/Health Care	1.026**	.268	-1.486	.639
	(.4672)	(1.0484)	(1.6757)	(.5321)
Information/Cultural	.027	-1.335	.838	.143
	(.4295)	(1.1858)	(1.0996)	(.4038)
Occupation				
Proportion Managers	.630	-1.254	-.956	.474
	(.6794)	(.9123)	(1.3294)	(.4583)
Proportion Professional	.082	-.545	.160	.458
	(.6361)	(1.2284)	(1.8153)	(.3946)
Proportion Sales	.074	.497	.784	.273
	(.5200)	(1.0507)	(1.2554)	(.3888)
Proportion Administrative	-.243	-.990	.103	.203
	(.5532)	(.9490)	(1.2004)	(.4682)
Proportion Technical	.596	.554	-.370	.465
	(.4623)	(1.0190)	(1.3312)	(.3862)
Institutional				
Proportion Covered by CBA	.293	-.197	1.463	.164
	(.3092)	(.8045)	(1.1060)	(.2451)
HR Unit	.406*	.787	.450	.856***
	(.2252)	(.9718)	(1.0163)	(.1972)
Innovation				

Process Innovation	.433*	.555	.866	.653***
	(.2564)	(1.0448)	(.9462)	(.2178)
Product Innovation	.197	-.261	-.044	-.063
	(.1959)	(.5095)	(.5975)	(.1791)
Turnover				
Turnover	.146	.006	-.271	.186
	(.1924)	(.1571)	(.3063)	(.2261)
Downsized	.173	1.010	.669	.254
	(.2590)	(1.0035)	(.8288)	(.1978)
Firm Characteristics				
Percentage Assets Foreign held	.003	.005	-.0007	.001
	(.0024)	(.0130)	(.0094)	(.0026)
Proportion Full-Time	1.356***	1.430*	.812	1.067**
	(.4151)	(.8574)	(1.0059)	(.5271)
Multi-establishment	.512***	-.261	.918*	.006
	(.1611)	(.6363)	(.5397)	(.1488)
Relative 2060 Earnings	.293	-.007	-.068	-.061
	(.1972)	(.5089)	(.4845)	(.1910)
Competition				
1-5 Competing Firms	-.166	1.296*	1.234	.181
	(.5308)	(.7621)	(1.4692)	(.4668)
6-20 Competing Firms	.018	1.404	1.469	.265
	(.5638)	(.9026)	(1.5011)	(.4631)
20+ Competing Firms	-.126	2.410***	.972	.067
	(.5802)	(.8240)	(1.4089)	(.4446)
Compete Local	.118	.145	-.409	.069
	(.2535)	(.6604)	(.7896)	(.1763)
Compete Canada	.074	.047	.295	-.254
	(.1963)	(.3913)	(.5181)	(.2186)
Compete USA	-.259	.003	-.040	.452**
	(.2221)	(.4325)	(.5069)	(.1987)
Compete Rest-of-World	.393	-.039	-.222	-.069
	(.2677)	(.6111)	(.6129)	(.1688)
Business Strategies				
R&D Business Strategy	.134**	-.102	.055	.116**
	(.0646)	(.1450)	(.1747)	(.0565)
Organizational Business Strat.	.074	.391*	.039	.144**
	(.1053)	(.2162)	(.2440)	(.0688)
Cost Control Business Strategy	-.051	.081	-.048	-.173*
	(.1481)	(.2913)	(.3064)	(.1018)
Region				
Atlantic	.375	.774	-.383	-.550*
	(.3642)	(.7089)	(.7833)	(.2868)
Quebec	.515**	.083	-.490	.227
	(.2422)	(.5708)	(.6225)	(.2636)
Prairie	-.162	-.094	-.032	.413
	(.3910)	(.7666)	(.6686)	(.3257)
Alberta	-.516*	.450	-.120	-.129
	(.3069)	(.5661)	(.5858)	(.2108)
BC	.066	-.307	.353	-.199
	(.3364)	(.6593)	(.5870)	(.2858)
CBA Clauses				
Technological Provisions	-.491	.466	-2.382	-.096
	(.4499)	(1.1272)	(1.4876)	(.3226)
Reorganization Provisions	.577	-.219	.720	.079
	(.4399)	(1.2088)	(1.4429)	(.5475)

Participation Provisions	.032	.899	-1.008	-.112
	(.4083)	(1.1691)	(.9930)	(.2623)
Health & Safety Provisions	-.192	-.207	-.711	.242
	(.4262)	(1.5018)	(1.6563)	(.4965)
Education Training Provisions	.035	-1.125	1.021	-.022
	(.3250)	(1.2511)	(1.2741)	(.3309)
Work Organization				
Flexible Job Design				
Problem Solving Teams				
Labour-Management Comm.				
Self-Directed Work Groups				
Constant	1.258	1.059	1.431	3.713***
	(1.4582)	(5.4143)	(5.0093)	(1.4063)
Inverse Mills Ratio				
Mills	.718			
	(.5506)			
Mills (Classroom = 1)		.785		-.153
		(1.7130)		(.7136)
Mills (Classroom = 0)			.594	
			(1.6191)	
Mills (OTJ = 1)			.233	.777
			(1.5294)	(.4752)
Mills (OTJ = 0)		.242		
		(1.1911)		
Auxiliary Regression R^2				
Mills	0.8974			
Mills (Classroom = 1)		0.9737		0.9248
Mills (Classroom = 0)			0.9698	
Mills (OTJ = 1)			0.9652	0.9230
Mills (OTJ = 0)		0.9722		
Number of Observations	2509	256	304	1214
SSR	438609.87	20308.43	53184.14	39546.02
Adjusted R^2	0.2093	0.4232	0.4524	0.4232

Source: WES 2002, author's calculations. Standard errors are in parenthesis. * denotes statistically significant at a 90% level of confidence. ** denotes statistically significant at a 95% level of confidence. *** denotes statistically significant at a 99% level of confidence.

Table 17
Two- Step Selection Corrected Employer Provided Training Expenditure per Employee Estimates 2002

Variable	Two-Step Selection Correction		
	Bivariate Probit		
	Classroom Expenditure	OTJ Expenditure	Classroom & OTJ Expenditure
Ln(Firm Size)	-.584***	-.578***	-.290
	(.2144)	(.2249)	(.1840)
Industry			
Forestry/Mining	1.067	.198	.772**
	(.8896)	(1.7709)	(.3843)
Labor Intensive Tertiary Manu.	.207	-.391	-.508
	(.9369)	(.8757)	(.4000)
Secondary Manufacturing	-1.244	1.670	.913***
	(1.1986)	(1.4872)	(.3098)
Capital Intensive Tertiary Manu.	-.705	-.930	.824**
	(1.0092)	(.8026)	(.3586)
Construction	-1.155	.688	1.184***
	(1.0416)	(.7749)	(.3392)
Transport/Storage/Wholesale	-1.007	-.419	.533
	(.8212)	(.8766)	(.3589)
Communications/Utilities	-.039	-2.103	.521
	(.9239)	(1.4869)	(.4705)
Retail/Commercial	.367	-.485	.670
	(.9317)	(.9058)	(.4103)
Finance/Insurance	-1.194	-1.070	.772
	(.9054)	(1.0059)	(.5215)
Real Estate	-.445	-1.377	.481
	(1.1810)	(1.0002)	(.4623)
Business Services	.264	-.355	.936***
	(.9263)	(1.0110)	(.3597)
Education/Health Care	-.091	-2.720	.728
	(.8932)	(1.8914)	(.5236)
Information/Cultural	-1.460	.886	.140
	(1.3214)	(.9914)	(.3895)
Occupation			
Proportion Managers	-1.320	-1.377	.509
	(.9381)	(1.3246)	(.4479)
Proportion Professional	-.838	-.669	.450
	(1.0032)	(1.4764)	(.4332)
Proportion Sales	.910	.871	.250
	(1.1589)	(1.0909)	(.3967)
Proportion Administrative	-.976	.021	.200
	(.9326)	(1.1539)	(.4720)
Proportion Technical	.169	-1.073	.500
	(.6739)	(.9852)	(.3697)
Institutional			
Proportion Covered by CBA	-.021	1.749*	.196
	(.6738)	(1.0248)	(.2443)
HR Unit	.918	.351	.832***
	(.9322)	(.9267)	(.2178)
Innovation			

Process Innovation	.409	.719	.642***
	(.6211)	(.5307)	(.2224)
Product Innovation	-.329	-.232	-.042
	(.4793)	(.5656)	(.1645)
Turnover			
Turnover	-.054	-.379	.188
	(.1606)	(.3394)	(.2265)
Downsized	1.010	.566	.260
	(.8958)	(.7095)	(.1976)
Firm Characteristics			
Percentage Assets Foreign held	.004	-.002	.001
	(.0092)	(.0067)	(.0027)
Proportion Full-Time	1.104	.445	1.103**
	(.7838)	(.9357)	(.5266)
Multi-establishment	-.386	.656	.047
	(.5429)	(.5238)	(.1530)
Relative 2060 Earnings	-.203	-.323	-.043
	(.3733)	(.4140)	(.1962)
Competition			
1-5 Competing Firms	1.308*	.638	.163
	(.7171)	(1.3430)	(.4663)
6-20 Competing Firms	1.424*	.911	.248
	(.8255)	(1.3352)	(.4619)
20+ Competing Firms	2.307***	.417	.082
	(.7765)	(1.3611)	(.4428)
Compete Local	.155	-.251	.071
	(.6309)	(.7536)	(.1748)
Compete Canada	.003	.191	-.249
	(.4132)	(.4908)	(.2174)
Compete USA	.052	.124	.454**
	(.4165)	(.4825)	(.1980)
Compete Rest-of-World	.010	-.306	-.082
	(.5447)	(.5972)	(.1695)
Business Strategies			
R&D Business Strategy	-.167	-.029	.119*
	(.1319)	(.1606)	(.0621)
Organizational Business Strat.	.374*	.007	.147**
	(.2112)	(.2165)	(.0674)
Cost Control Business Strategy	.091	-.106	-.170
	(.2917)	(.3198)	(.1082)
Region			
Atlantic	.631	-.882	-.516
	(.7559)	(.8055)	(.3179)
Quebec	-.024	-.604	.282
	(.5547)	(.5422)	(.2424)
Prairie	.143	.046	.401
	(.7464)	(.6745)	(.3051)
Alberta	.534	.136	-.125
	(.5866)	(.6041)	(.2230)
BC	-.344	.286	-.204
	(.6223)	(.5185)	(.2822)
CBA Clauses			
Technological Provisions	.428	-2.359	-.084
	(1.1228)	(1.4913)	(.3246)
Reorganization Provisions	-.519	-.172	.114
	(1.1320)	(1.5870)	(.5199)

Participation Provisions	.999	-1.128	-.141
	(1.1639)	(1.0327)	(.2823)
Health & Safety Provisions	.163	.364	.204
	(1.4624)	(1.6078)	(.5117)
Education Training Provisions	-1.247	.871	.000001
	(1.2312)	(1.2129)	(.3386)
Work Organization			
Flexible Job Design			
Problem Solving Teams			
Labour-Management Comm.			
Self-Directed Work Groups			
Constant	3.762*	3.889*	3.412**
	(2.1230)	(2.1240)	(1.6063)
Inverse Mills Ratio			
Mills (Classroom = 1)	-.049		.234
	(.2060)		(.7933)
Mills (Classroom = 0)		-.538	
		(.3479)	
Mills (OTJ = 1)		.090	.787*
		(.1863)	(.4238)
Mills (OTJ = 0)	.084		
	(.1216)		
Auxiliary Regression R^2			
Mills (Classroom = 1)	0.8291		0.9449
Mills (Classroom = 0)		0.8677	
Mills (OTJ = 1)		0.8015	0.8969
Mills (OTJ = 0)	0.7001		
Number of Observations	256	304	1214
SSR	20233.09	51922.75	39519.38
Adjusted R^2	0.4254	0.4654	0.4236

Source: WES 2002, author's calculations. Standard errors are in parenthesis. * denotes statistically significant at a 90% level of confidence. ** denotes statistically significant at a 95% level of confidence. *** denotes statistically significant at a 99% level of confidence.

Table 18
Two-Step Selection Corrected Employer Provided Training Expenditure per Employee Estimates 2002

Variable	Two-Step Selection Correction			
	Probit	Independent Probit		
	Training Expenditure	Classroom Expenditure	OTJ Expenditure	Classroom & OTJ Expenditure
Ln(Firm Size)	-.086	-.439	1.034	-.363***
	(.1218)	(.3920)	(.7243)	(.1217)
Industry				
Forestry/Mining	.713	1.216	-2.100	.431
	(.5138)	(.9265)	(1.8485)	(.3370)
Labor Intensive Tertiary Manu.	-.039	.396	-2.126	-.412
	(.5370)	(1.2221)	(1.6054)	(.4002)
Secondary Manufacturing	.158	-.050	-1.837	.489
	(.3653)	(.9847)	(1.4809)	(.3547)
Capital Intensive Tertiary Manu.	.130	.656	-.621	.693*
	(.3895)	(1.2970)	(1.0495)	(.4200)
Construction	1.201***	1.683	2.180	1.339***
	(.4275)	(1.4488)	(1.3630)	(.4851)
Transport/Storage/Wholesale	.382	.991	-.972	.441
	(.3954)	(.8256)	(.9820)	(.3370)
Communications/Utilities	1.010***	.665	-1.561	.511
	(.3516)	(1.1041)	(2.1892)	(.4051)
Retail/Commercial	.622	1.503	-1.314	.557
	(.5001)	(1.0480)	(1.1952)	(.4704)
Finance/Insurance	1.499***	.947	.436	.578
	(.4682)	(1.0615)	(1.8040)	(.4210)
Real Estate	1.181**	-.465	-2.848*	.202
	(.4764)	(1.2592)	(1.6712)	(.4127)
Business Services	1.132**	1.681	.769	.696
	(.4512)	(1.6097)	(1.5624)	(.4521)
Education/Health Care	1.428**	1.907	-2.266	1.059**
	(.5959)	(2.0002)	(2.1940)	(.5383)
Information/Cultural	.290	-.227	-.087	.229
	(.4736)	(1.3065)	(1.9452)	(.3550)
Occupation				
Proportion Managers	-.734	1.407	-1.333	.472
	(.8685)	(1.8091)	(1.2993)	(.5336)
Proportion Professional	-.029	-.544	2.257	.697
	(.8118)	(1.6251)	(4.4983)	(.8023)
Proportion Sales	-.139	-.265	2.239	.386
	(.5333)	(1.4297)	(1.7649)	(.3854)
Proportion Administrative	-.817	-1.074	-.105	-.096
	(.6800)	(1.3111)	(2.0190)	(.5378)
Proportion Technical	.569	.340	.772	-.036
	(.4611)	(.9153)	(1.3525)	(.5064)
Institutional				
Proportion Covered by CBA	.397	.184	-.532	.102
	(.2641)	(.8145)	(1.2814)	(.2768)
HR Unit	.460**	.156	-1.412	.812***
	(.2271)	(.8462)	(1.1715)	(.1941)
Innovation				

Process Innovation	.545***	1.369	.295	.255
	(.2060)	(.9624)	(.8020)	(.2264)
Product Innovation	.038	-.427	.977	-.031
	(.2444)	(.7737)	(.9957)	(.2228)
Turnover				
Turnover	-.025	-.270	.843	.112
	(.1744)	(.3400)	(.6157)	(.2154)
Downsized	-.075	-.044	.825	.257
	(.2822)	(.6978)	(.7701)	(.2167)
Firm Characteristics				
Percentage Assets Foreign held	.006*	.019	.011	.003
	(.0031)	(.0151)	(.0142)	(.0028)
Proportion Full-Time	1.653**	.071	-.446	1.608***
	(.6715)	(1.0967)	(1.5555)	(.5530)
Multi-establishment	.417*	.267	.348	.277
	(.2212)	(.4933)	(.8968)	(.1929)
Relative 2060 Earnings	.268	-.510	.203	-.108
	(.2125)	(.5350)	(.7742)	(.1774)
Competition				
1-5 Competing Firms	-.993	1.752	1.600	-.095
	(.6443)	(1.2272)	(2.9298)	(.5423)
6-20 Competing Firms	-.946	2.398*	2.589	-.255
	(.6516)	(1.4382)	(2.9041)	(.5971)
20+ Competing Firms	-1.190*	2.386*	2.289	-.085
	(.7218)	(1.4318)	(2.8729)	(.5862)
Compete Local	-.002	-.813	-.330	.008
	(.1980)	(.6139)	(.7803)	(.1725)
Compete Canada	.130	.502	.595	-.288
	(.2559)	(.4952)	(.6344)	(.2010)
Compete USA	-.382	.074	.350	.341*
	(.2636)	(.5543)	(.7402)	(.1765)
Compete Rest-of-World	.240	-.271	-.618	-.063
	(.2231)	(.7690)	(.6764)	(.1841)
Business Strategies				
R&D Business Strategy	.178**	.154	-.126	.083
	(.0820)	(.2482)	(.2196)	(.0779)
Organizational Business Strat.	-.132	-.143	.020	.113
	(.1390)	(.3023)	(.3047)	(.0829)
Cost Control Business Strategy	.210	.237	.247	-.008
	(.1705)	(.3144)	(.3973)	(.1274)
Region				
Atlantic	.252	-.843	-.256	-.237
	(.3827)	(.8395)	(1.1505)	(.3283)
Quebec	.778***	1.047*	.465	.619**
	(.2766)	(.5382)	(.7923)	(.2550)
Prairie	-.056	.113	1.442	.016
	(.3079)	(1.0555)	(1.5816)	(.3353)
Alberta	-.074	.128	1.081	.078
	(.3162)	(.6383)	(.7883)	(.2710)
BC	-.282	.360	.982	-.093
	(.3072)	(.9160)	(.7951)	(.3263)
CBA Clauses				
Technological Provisions	-.886*	.891	-1.826	-.169
	(.4620)	(.9653)	(1.3699)	(.3093)
Reorganization Provisions	.391	-1.454	.584	.0001
	(.5202)	(1.2462)	(1.6278)	(.3931)

Participation Provisions	.652**	.002	1.582	-.059
	(.3262)	(1.4243)	(1.2932)	(.2731)
Health & Safety Provisions	-.327	.527	-1.591	.293
	(.4375)	(1.0001)	(1.6675)	(.5462)
Education Training Provisions	-.041	.048	-.282	.031
	(.2888)	(.8098)	(1.2050)	(.3051)
Work Organization				
Flexible Job Design	.049	.451	.506	-.119
	(.2749)	(.6008)	(.7090)	(.2004)
Problem Solving Teams	.563**	.755	.748	-.149
	(.2583)	(1.3530)	(1.3673)	(.2809)
Labour-Management Comm.	-.162	.652	.142	.030
	(.2200)	(.7225)	(.7250)	(.1577)
Self-Directed Work Groups	.380	1.860	1.301	.100
	(.3164)	(1.6528)	(1.0588)	(.2778)
Constant	2.503*	3.564	-5.661	3.958**
	(1.4454)	(3.5574)	(5.4213)	(1.5901)
Inverse Mills Ratio				
Mills	.170			
	(1.0469)			
Mills (Classroom = 1)		-.201		.206
		(1.4461)		(.6136)
Mills (Classroom = 0)			1.062	
			(2.8014)	
Mills (OTJ = 1)			2.704	.089
			(2.5452)	(.7462)
Mills (OTJ = 0)				
		.663		
		(2.2401)		
Auxiliary Regression R^2				
Mills	0.8805			
Mills (Classroom = 1)		0.9787		0.9304
Mills (Classroom = 0)			0.9649	
Mills (OTJ = 1)			0.9913	0.9300
Mills (OTJ = 0)		0.9887		
Number of Observations	2191	189	230	1134
SSR	200885.24	4026.48	16029.08	26506.37
Adjusted R^2	0.3139	0.5785	0.6497	0.4299

Source: WES 2002, author's calculations. Standard errors are in parenthesis. * denotes statistically significant at a 90% level of confidence. ** denotes statistically significant at a 95% level of confidence. *** denotes statistically significant at a 99% level of confidence.

Table 19
Two- Step Selection Corrected Employer Provided Training Expenditure per Employee Estimates 2002

Variable	Two-Step Selection Correction		
	Bivariate Probit		
	Classroom Expenditure	OTJ Expenditure	Classroom & OTJ Expenditure
Ln(Firm Size)	-.574***	.594	-.535***
	(.2040)	(.3626)	(.1237)
Industry			
Forestry/Mining	1.477	-2.017	.676*
	(.9796)	(1.9519)	(.3809)
Labor Intensive Tertiary Manu.	.606	-1.118	-.148
	(.8706)	(1.1671)	(.4140)
Secondary Manufacturing	-.071	-2.011	.501
	(.8928)	(1.4581)	(.3487)
Capital Intensive Tertiary Manu.	.447	-1.201	.854**
	(.9571)	(.9972)	(.3971)
Construction	1.244	1.351	1.236***
	(.8755)	(1.0938)	(.4487)
Transport/Storage/Wholesale	1.068	-.556	.503
	(.7762)	(1.0055)	(.3312)
Communications/Utilities	.606	-1.709	.268
	(1.0283)	(1.9446)	(.4027)
Retail/Commercial	1.304	-1.763	.401
	(.8054)	(1.1669)	(.4549)
Finance/Insurance	.700	-.338	.250
	(.9039)	(1.5950)	(.3833)
Real Estate	-.234	-2.655	.361
	(1.2371)	(1.6306)	(.4056)
Business Services	1.230	-.154	.691
	(1.2187)	(1.4727)	(.4370)
Education/Health Care	1.612	-2.401	.914*
	(1.7604)	(2.2457)	(.5097)
Information/Cultural	-.134	-.015	.484
	(1.2548)	(1.9086)	(.3768)
Occupation			
Proportion Managers	1.677	-1.459	.458
	(1.7080)	(1.2583)	(.5524)
Proportion Professional	-.625	.252	-.424
	(1.2314)	(2.4050)	(.7815)
Proportion Sales	-.327	1.446	.386
	(1.1880)	(1.6136)	(.3744)
Proportion Administrative	-.969	-.307	.372
	(1.3205)	(1.8602)	(.5391)
Proportion Technical	.450	.776	-.251
	(.8635)	(1.2050)	(.5041)
Institutional			
Proportion Covered by CBA	.281	-.298	-.105
	(.6915)	(1.0356)	(.2367)
HR Unit	.094	-1.355	.903***
	(.7536)	(1.1049)	(.1899)
Innovation			

Process Innovation	1.064*	-.069	.218
	(.6392)	(.6280)	(.2279)
Product Innovation	-.462	.447	-.102
	(.5155)	(.6006)	(.1978)
Turnover			
Turnover	-.342	.504	-.028
	(.2674)	(.5504)	(.2022)
Downsized	-.196	.201	.304
	(.6347)	(.6122)	(.2098)
Firm Characteristics			
Percentage Assets Foreign held	.014	-.0003	.0003
	(.0086)	(.0101)	(.0026)
Proportion Full-Time	-.061	-.672	1.005*
	(1.1030)	(1.4077)	(.5461)
Multi-establishment	.293	.135	.032
	(.4459)	(.6797)	(.2059)
Relative 2060 Earnings	-.449	.062	-.326*
	(.3985)	(.5722)	(.1873)
Competition			
1-5 Competing Firms	1.709	2.465	.427
	(1.1218)	(2.6148)	(.5211)
6-20 Competing Firms	2.094**	3.038	.253
	(1.0203)	(2.6253)	(.5715)
20+ Competing Firms	2.097*	2.607	.299
	(1.0742)	(2.5925)	(.5487)
Compete Local	-.718	-.461	-.004
	(.6041)	(.7793)	(.1694)
Compete Canada	.493	.491	-.316
	(.4846)	(.6329)	(.1970)
Compete USA	.104	.436	.381**
	(.5524)	(.7142)	(.1728)
Compete Rest-of-World	-.254	-.580	-.024
	(.7175)	(.6732)	(.1884)
Business Strategies			
R&D Business Strategy	.186	-.041	.056
	(.1749)	(.1929)	(.0686)
Organizational Business Strat.	-.185	-.137	.078
	(.1950)	(.2589)	(.0750)
Cost Control Business Strategy	.241	.198	.022
	(.2886)	(.4114)	(.1293)
Region			
Atlantic	-.607	.125	-.083
	(.7551)	(.9231)	(.3174)
Quebec	1.028*	.203	.371
	(.5522)	(.6420)	(.2436)
Prairie	-.049	1.639	.211
	(.8739)	(1.0920)	(.2509)
Alberta	.091	1.144	.135
	(.6056)	(.7581)	(.2458)
BC	.209	.656	-.177
	(.8040)	(.7097)	(.3063)
CBA Clauses			
Technological Provisions	.859	-1.928	.038
	(.8994)	(1.4695)	(.3021)
Reorganization Provisions	-1.264	.639	-.195
	(.9802)	(1.3731)	(.3624)

Participation Provisions	-.365	1.010	-.444
	(.8032)	(1.2178)	(.2906)
Health & Safety Provisions	.460	-1.972	.673
	(.9347)	(1.6708)	(.5965)
Education Training Provisions	.050	-.197	.189
	(.7574)	(1.2028)	(.3127)
Work Organization			
Flexible Job Design	.592	.326	-.150
	(.6729)	(.7069)	(.1960)
Problem Solving Teams	.334	-.294	-.468*
	(.6863)	(.8891)	(.2769)
Labour-Management Comm.	.686	.003	.085
	(.6598)	(.7388)	(.1547)
Self-Directed Work Groups	1.731	1.851	.410
	(1.3733)	(1.1496)	(.2943)
Constant	3.896*	-1.738	6.106***
	(2.3379)	(3.8068)	(1.5358)
Inverse Mills Ratio			
Mills (Classroom = 1)	-.118		-1.228**
	(.1053)		(.6164)
Mills (Classroom = 0)		-.047	
		(.1867)	
Mills (OTJ = 1)		.183	.222
		(.2872)	(.7672)
Mills (OTJ = 0)	-.017		
	(.0793)		
Auxiliary Regression R^2			
Mills (Classroom = 1)	0.8074		0.8929
Mills (Classroom = 0)		0.7613	
Mills (OTJ = 1)		0.6746	0.8873
Mills (OTJ = 0)	0.8285		
Number of Observations	189	230	1134
SSR	3974.67	16415.23	25873.00
Adjusted R^2	0.5839	0.6413	0.4435

Source: WES 2002, author's calculations. Standard errors are in parenthesis. * denotes statistically significant at a 90% level of confidence. ** denotes statistically significant at a 95% level of confidence. *** denotes statistically significant at a 99% level of confidence.