THE IMPACT OF MEXICO'S RETRAINING PROGRAM ON EMPLOYMENT AND WAGES

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Abstract

This paper analyzes the impact and effectiveness of the Mexican Labor Retraining Program for Unemployed and Displaced Workers (PROBECAT). The strategy followed is to compare the post-training labor market experiences of trainees with those of a comparison group--a matched sample of unemployed individuals who were eligible for, but did not participate in, the PROBECAT program. The results of this exercise suggest that participation in PROBECAT reduced the mean duration of unemployment for both male and female trainees, and increased the monthly earnings of males, but not of females. The results also indicate that the post-training earnings effect varied systematically by level of schooling attainment, with the largest earnings increases (of about 28 to 37 percent) found for males with 6 to 12 years of education.

I. INTRODUCTION

In 1984, as a response to growing economic crisis, the Government of Mexico established a retraining program for unemployed and displaced workers (Programa de Becas de Capacitacion para Trabajadores, or PROBECAT). Its objective was to dampen the social costs of major economic restructuring and rising unemployment during this period of macroeconomic turmoil. As adjustment efforts accelerated during the latter half of the decade, the need for policies targeting the unemployed and facilitating their reemployment became more pressing. As a result, in 1987, the retraining program was strengthened, and its scope and coverage expanded. Since then, the PROBECAT program has provided short-term vocational training to over 250,000 unemployed people.

The Mexican Government is currently considering an extension of the PROBECAT program, motivated in large part by several reasons. The most important is concern about the impact of the North America Free Trade Agreement (NAFTA) on migration flows especially from rural areas, and on unemployment. Second, while the adjustment process to date has taken place with relatively little impact on observed levels of unemployment, substantial labor reallocation between expanding and contracting sectors is likely to occur with further liberalization and privatization of the Mexican economy. The third reason is that PROBECAT is the only unemployment program currently in place in Mexico. In making decisions about the future of PROBECAT, policymakers in Mexico will need improved information about the labor market impacts of retraining on target populations as well as the cost-effectiveness of the program.[1/]

The purpose of this paper is to evaluate the impact of PROBECAT on the employment and incomes of trainees. We seek to address four key questions: (i) what is the impact of training on the subsequent employment experiences of trainees?; (ii) does training increase the speed with which trainees move from unemployment to employment?; (iii) conditional upon finding employment, what effect does training have on the monthly earnings, weekly hours worked, and hourly wages of trainees?; and (iv) do the monetary benefits from program participation outweigh the costs of providing retraining

1/ Program impact evaluations, while an accepted practice in many industrialized countries, is less common among developing countries. A notable exception is the evaluation of Colombia's SENA training program by Jimenez and Kugler (1987). In part, this may be due to a paucity of relevant data and to lack of familiarity with program evaluation methodologies. For Mexico, the availability of longitudinal data on both a cohort of PROBECAT trainees and a comparison group of unemployed, offers a unique opportunity to study the impact of retraining programs in a developing country setting.

for the unemployed?

We address these issues by comparing the post-training labor market experiences of PROBECAT trainees with those of a comparison group--a sample of unemployed individuals who were eligible for, but did not participate in, the PROBECAT program. For trainees, we use detailed data on the post-training experiences of the 1990 trainee cohort elicited in a retrospective survey conducted by the Secretariat of Labor and Social Welfare (STPS) in 1992. For the comparison group, we use panel data on a random sample of unemployed individuals drawn from the 1990-91 quarterly urban labor force surveys (ENEU). This approach improves on previous PROBECAT evaluations.[2/] Earlier studies were subject to several data and methodological limitations: (a) crude wage data--earnings information was bracketed, and reported only in reference to the minimum wage, and (b) no comparison group--the outcomes for training completers six months out are compared to outcomes three months out for the group that failed to complete the training program. Both limitations have been overcome in our evaluation.

We use a statistical methodology to account for selection bias arising from the non-random selection of individuals into the PROBECAT program.[3/] The use of statistical methods for program evaluation has both its detractors and supporters--several studies suggest that non-experimental methods may be subject to mispecification error, while other studies question whether experimental evaluations are really necessary.[4/] We acknowledge that the statistical methods used here are not immune to criticism, and therefore caution that the results be interpreted with care--more as initial estimates than as a definitive evaluation of PROBECAT. Nonetheless, we note that the experimental evaluation approach is both politically and practically difficult to implement, and thus, is not a viable option for many developing countries. In these countries, there may be greater payoffs to improving both the quality of data and methodologies used in program evaluation. This paper represents a first step in that direction.

2/ See, for example, the reports by the Secretaria de Trabajo y Prevision Social (1988, 1989, and 1990) and Carlson (1991).

3/ An alternative, experimental evaluation methodology is to randomly assign individuals into two groups: participants and non-participants. This random assignment avoids the issue of selection bias so the program impact can be evaluated by simply comparing outcomes for the two groups.

4/ See LaLonde (1984) Fraker and Maynard (1985) for critiques of non-experimental evaluation methodologies, and Heckman and Hotz (1987 and 1989) for a different perspective. A recent review article by Levitan (1992) summarizes the advantages and disadvantages of both statistical and experimental approaches to program evaluation.

In Section II, we begin by providing a broad overview of unemployment in Mexico and the PROBECAT program. We also describe several surveys to be used in comparing trainees and unemployed individuals that did not participate in training. In Section III, we discuss several methodological issues that arise in training program evaluations, and our approach to resolving them. In Sections IV and V, we report our estimates of the effects of training on the probabilities of employment, time-to-first job, monthly earnings, hours worked per week, and hourly wages. In Section VI, we present initial estimates of the cost-benefit ratios of PROBECAT training for male and female participants. We conclude by summarizing the most important findings and discussing their implications.

II. UNEMPLOYMENT AND PROBECAT: BASIC EATURES

Basic Characteristics of Unemployment in Mexico

According to official statistics, the open unemployment rate in Mexico is relatively low. In 1992, it stood at 2.9 percent of the labor force, and even in the worst years of the adjustment crisis, did not rise beyond 6.1 percent. However, these figures have several shortcomings. First, they refer only to urban unemployment, and thus exclude the sizeable fraction of the Mexican population living in rural areas. Second, they are based on a loose definition of employment, which counts an individual as employed if he/she works at least one hour per week. Third, they include only those individuals who are actively searching for a job. This last point is important since research suggests that the distinction between "unemployed" and "not in the labor force" based on intensity of search is usually very weak.[5/] This is confirmed by our analysis of the employment data for Mexico.[6/] We find a large fraction of idle men--out of work individuals able to work, not studying and not taking care of the household. When the definition of unemployment is expanded to include these idled men, the aggregate unemployment rate in 1991 rises from 2.8 percent to 5.5 percent.[7/]

5/ For a discussion of the importance of considering these "idle" workers as unemployed, see Clark and Summers (1979) and Summers (1986).

6/ See Revenga and Riboud (1993).

7/ This figure is calculated for 1991 because that is the last year for which we have access to the detailed unemployment survey tapes. Note that we do not define a comparable group of idle female workers because family reponsibilities tend to make their labor market behavior patterns much more complex, with frequent periods out of the labor force.

Table 1 reports the distribution of unemployment by age and educational attainment categories. Using the standard definition of unemployment, we find that for men as much as 60 percent of total unemployment is accounted for by individuals age 25 and below. The comparable figure for females is even higher, at about 77 percent. With regards to education, 53 percent of total male unemployment and 62 percent of female unemployment is accounted for by those with 7 to 12 years of schooling. Individuals with completed secondary education (9 years of schooling) account for 20 percent of male unemployment and about 19 percent of total female unemployment. Those with a high school education (10-12 years of schooling) account for an additional 20 percent of male unemployment and 35 percent of female unemployment.

When the expanded definition of unemployment is used, the overall unemployment rate rises as noted above, and the unemployment distribution of males by age and education changes. The proportion of unemployed males age 25 and below increases slightly from 62.2 percent to 63.5 percent. Much more striking is the increase in the proportion of unemployed males with less than 9 years of completed schooling--from 40 percent to nearly 50 percent. This more economically meaningful, expanded definition of unemployment will be used throughout the analyses that follow.

Program Features of PROBECAT

The PROBECAT program is administered through the network of state employment offices. Since 1987, it has trained a total of 251,181 unemployed persons and provided 9268 courses. During the training period, program participants receive a stipend equal to the minimum wage. Upon completion of the course, the local state employment office helps trainees find a job. In practice, however, most trainees surveyed report finding jobs on their own and not through the state employment office.

The majority of program participants enroll in classroom training, primarily in short-term vocational courses offered through contracts with local private and public institutions. Courses vary in duration from one to six months, with the majority of courses (87 percent) lasting about three months. Training is provided in a variety of occupational areas: carpentry, construction, electricity, food preparation, graphic arts and design, handicrafts, machinery, mechanics, refrigeration, services and administration, shoe repair, textiles and apparel, and welding. In principle, courses are organized to respond to the needs of the local labor market, and are designed to redress local shortages of workers with particular skills. These needs are determined through periodic studies of local labor market conditions.

Not everyone is eligible to participate in the PROBECAT program. The selection procedure gives variable weights to different criteria, including the number of economic dependents, having attained certain levels of basic education, prior work experience, and having been unemployed for less than three months. The weighting scheme is quite complex and non-linear, and only individuals with a total composite score exceeding a threshold level are eligible to join the program. In addition, participants must (in theory) be between the ages of 20 and 55, and be registered as a job-seeker at the local state employment office.[8/] This non-random selection of individuals into PROBECAT poses potentially serious measurement problems for an evaluation of the training program.

Data Sources

A number of surveys have been fielded to help monitor and evaluate the PROBECAT program. The first set of surveys, comprising follow-ups of trainees at 3 and 6 months after program completion, has been used in several reports written by STPS (1988, 1989, and 1990). A second, more complete retrospective survey was administered to the 1990 cohort of trainees in early 1992.[9/] It elicited a wealth of information on all jobs held since completion of training until February 1992, including the start and end dates for each job, monthly salary, hours worked per week, occupation and industry. Our evaluation is based on this second PROBECAT survey.

As a comparison group for the trainees, we used a sample of unemployed individuals drawn from the 1990-91 quarterly urban labor force survey (ENEU). The ENEU, a household-based survey of the sixteen main urban areas in Mexico, elicited detailed information on employment status, jobs, monthly salary, and hours of work broadly comparable to the PROBECAT survey. The ENEU uses a quarterly rotation system so that each rotation group (of households) remains in the survey for five consecutive quarters, and then leaves the sample. We obtained panel data for the rotation group that remained in the survey from the third quarter of 1990 to the third quarter of 1991--the period spanned by the trainee data--and drew our comparison group from this sample. This comparison group includes all

8/ The original age bracket was amended to allow a small number of participants between the ages of 16 and 20. Follow-up surveys also show the presence of a few older participants above age 55.

9/ This retrospective survey was based on a sample of 1,995 trainees who were administered a 3 month follow-up in 1990. Out of this original sample, 273 individuals could not be located for the 1992 retrospective survey. Consistency checks also revealed the presence of 4 individuals in the 1992 survey who were not part of the original sample.

those who were unemployed in the third quarter of 1990 (whom we then track for a year).[10/] For certain analyses, we will augment this comparison group with a second cohort who became unemployed in the fourth quarter of 1990 (and were not in the first cohort). For this latter cohort, only nine months of data are available.

Table 2 presents summary information on the demographic characteristics of our trainee and comparison group samples. In 1990, the average PROBECAT male trainee was 28 years old, with the majority having completed primary schooling and some secondary education. About 41 percent were married. The average female trainee was 29 years old, with similar levels of education to males, and about 46 percent were married. Among those trainees who were unemployed at the time they entered the program, 74 percent reported having had previous work experience; the proportions are higher for males (85 percent) than for females (62 percent). Almost half the men (45 percent) identified themselves as being household heads. It is evident from Table 2 that trainees differ from the general population of the unemployed. Compared to the sample drawn from the ENEU, trainees tended to be slightly older, were more likely to be married or the household head, and to have completed secondary schooling. The trainee group also included a higher proportion of women than the comparison group (51.4 percent versus 46.1 percent, respectively).

III. THE EVALUATION METHODOLOGY

We are interested in estimating the impact of training on several outcome measures: (i) time taken to exit from unemployment (ie. time to first job); (ii) the probability of employment at three, six, and twelve months after the end of training; (iii) post-training monthly earnings; (iv) weekly hours of work; and (v) hourly wages. Analysis of such a wide variety of outcome measures departs from the traditional focus of most training evaluations on the earnings impact of training, with relatively less attention paid to its impact on subsequent employment.[11/] We believe that this approach provides a more complete characterization of program effects. For example, earnings comparisons are contingent upon having a

10/ Note that this is based on the expanded definition of unemployment that includes all individuals who (a) report being out of work the previous week, (b) are able to work, and (c) are not students or retirees, whether or not they are searching for a job.

11/ An exception is Card and Sullivan (1988), which looks at the impact of training on post-training employment histories. Most studies focus on earnings outcome, but typically without trying to disentangle the separate effects of training on employment, earnings, hours of work, and hourly wages.

job, and one impact of training may be to increase the likelihood of employment.[12/] Similarly, monthly earnings are the product of hours of work and hourly wage rates, and training may have very different effects on each of these two outcomes.

The principal methodological issue that arises in evaluating the impact of the PROBECAT program is that of selectivity bias. As Table 2 demonstrates, trainees are a non-random sample of the unemployed population. Failure to control for these differences in observed characteristics of trainees and comparisons can lead to biases in estimated program impacts. These biases are potentially exacerbated by systematic differences across groups in unobserved (to the analyst) characteristics, such as motivation, ability, or tastes.

We address the selection bias problem in two ways. One approach is to use the PROBECAT program's own selection criteria to define a matched group of unemployed individuals with similar attributes to the trainees. This involves two steps: first, estimating a probit model on the pooled trainee and unemployed samples relating the likelihood of program participation to the PROBECAT selection criteria for which we have data--marital status, number of children, dependents, years of schooling, and time in unemployment; in a second step, limiting the comparison group to those unemployed individuals with high predicted probability of program participation.[13/] This approach is adopted in the analyses of the employment effects of training. A second approach, which we use in the analyses of monthly salary, hours of work, and hourly wage outcomes, is based on the two-stage selectivity correction procedure developed by Heckman (1979). This involves, as before, estimating a model of selection into the PROBECAT program; in a second stage, calculating a variable to capture the individual's likelihood of program selection, and including this variable as a regressor in the outcome models to control for sample selectivity.[14/]

Neither approach is completely satisfactory. In both strategies, we are forced to address the

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12/ Card and Sullivan (1988) provide evidence that a large part of the measured training effect on earnings results from increases in the post-training employment of trainees.

13/ A similar approach is followed in Westat (1981, 1984), Bassi (1983) and Geraci (1984).

14/ Our use of two different selectivity correction approaches for discrete and continuous outcomes is justified on econometric grounds. The Heckman approach--which we use for earnings and hours worked--relies critically on the non-linearity of the first stage probit for identification of the selection correction term in the second stage. Arguably, the same approach is not appropriate for analyzing employment outcomes since (a) the second-stage outcome equations are themselves non-linear; and (b) the observables in the first-stage participation probit are likely to be correlated with the unobservables in the second-stage. As such, for this set of discrete outcomes, we adopt the matching procedure described in the text.

selection issue through the use of cross-sectional control variables, such as level of education and demographic characteristics. This will yield correct estimates if selection into the program is determined solely by those observable characteristics for which we are able to control. However, if selection occurs based on unobservable variables, or if it is influenced by variables for which we cannot control, then our estimates could easily be biased. This, no doubt, detracts from the overall robustness of our estimates of program impacts.

IV. TRAINING EFFECTS ON EMPLOYMENT

We begin the PROBECAT evaluation by assessing the impact of program participation on the likelihood of employment, both in the short-term and over increasingly longer periods of time. First, we ask if participation in the training program has any effect on the time it takes trainees to move from unemployment into a first job. Next, we ask whether trainees systematically differ from the comparison group in their probability of employment at three, six, and twelve months after time 0. For trainees, time 0 is time since completion of training; for the comparison group, this is time since we first observe them unemployed in the third quarter of 1990. Together, the two sets of analyses can be used to draw inferences about the proportion of time both groups spend in employment over the first twelve months.

Time To First Job

What is the impact of PROBECAT on time-to-first-job? For trainees, it is straightforward to construct a continuous measure of time-to-first-job (expressed in months) using information on the end-dates for training and the start-dates for the first job. For trainees that have not found a job within the sample period, we compute time elapsed from training completion to February 1992, and code this spell as censored. Constructing a time-to-first job measure was more difficult for the comparison group. For this group, we have a continuous measure of time unemployed up until the third quarter of 1990; subsequently, we only observe their employment status at discrete points in time (quarterly) over a one-year interval. The issue is that when their employment status first changes from one quarter to the next, we must infer when, within a three-month period, the individual found a job.

A number of assumptions may be used to estimate the commencement of employment. First, we can treat the unemployment duration reported by the comparison group in the third quarter of 1990 as being representative of the underlying distribution of incomplete unemployment spells. By appealing to steady state assumptions, we can estimate the distribution of completed spells of unemployment by

doubling the duration of incomplete spells reported.[15/] A second approach is to exploit the panel nature of the ENEU data to identify the first quarter in which their employment status changes (i.e. finds a job) or, if they remain unemployed at the end of one year, to code the unemployment spell as censored. To compute time-to-first-job, we can either assume that the job was found at the end, the middle, or the beginning of that interval. This corresponds to adding 3, 1.5, or 1 month(s) to incomplete unemployment spells first reported in the third quarter of 1990, plus number of subsequent, full quarters of unemployment.

Both approaches, and all three start-time assumptions, yielded similar results, namely, that time-to-first-job is always shorter for the trainees than for the comparison group. The assumption that the job is found at the beginning of the interval produces the lowest time-to-first-job for the comparison group, as might be expected. The results reported below are based on the second approach using this most stringent start-time assumption (job found at the beginning of the interval).[16/]

We corrected for selectivity bias by applying to the unemployed sample the same criteria used to select trainees into the program. We first estimate an equation for the probability of selection into the PROBECAT program, using the pooled trainee and unemployed samples. This probit model relates program participation to the criteria for which we have information: marital status, number of children and economic dependents, schooling, and time spent in unemployment at the selection point. We then limit the comparison group to "eligible" unemployed individuals with a high predicted probability of program participation.[17/] All the employment results presented below are based on comparisons of the trainees with the "matched" (selectivity-corrected) sample of unemployed individuals who were eligible for, but did not participate, in the PROBECAT program.

Figure 1 plots survival curves for male trainee and matched comparison groups using the raw duration data on time-to-first-job. These survival curves are defined as a function of time **t** (in months). They indicate the probability of remaining unemployed **t** months after entering unemployment. We present separate survival curves for those age 25 and under, and for those over 25 years old. They clearly show that trainees exit unemployment more quickly than do individuals from the comparison

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15/ See Salant (1977). This assumption is fairly strong, but not absurd for the Mexican data. Revenga and Riboud (1993) show that, in fact, the distribution of completed unemployment spells in the ENEU is remarkably similar to that inferred from the distribution of incomplete spells.

16/ Results using the first approach and the more lax start-time assumptions are available upon request.

17/ The cut-off point used to select these individuals was a predicted probability value of .6.

group: at three months, 62 percent of young trainees have left unemployment as compared to just 42 percent of the comparison group. The difference is more marked for the older trainees: 72 percent of them have left unemployment within 3 months, versus 33 percent of the comparison group. We estimate that the average duration of unemployment for male trainees under 25 is 1.4 months shorter than that for non-trainees; for trainees over 25, average duration of unemployment is 3.7 months shorter.

Figure 1 also shows survival curves for young males, age 25 and under, both with and without previous work experience. Young trainees with work experience exit unemployment more quickly than comparable non-trainees. However, for new entrants into the labor force, these patterns are quite different, with some trainees exiting unemployment relatively quickly, but others remaining unemployed for a long period of time. About 39 percent of young trainees without work experience remained unemployed twelve months after training completion. In contrast, all their young counterparts in the comparison group exited unemployment at twelve months. Not surprisingly, we find that the average duration of unemployment for this group of trainees exceeds that for comparable non-trainees by 1.5 months.

With the exception of age, these graphical comparisons do not control for systematic differences in the demographic characteristics of the trainee and comparison groups. The unadjusted estimates may be misleading if unemployment duration is related to level of educational attainment or other individual and household characteristics.[18/] To address this potential problem, we estimate a cox proportional hazards model of unemployment duration on the pooled trainee and comparison group samples. This model decomposes the reemployment probabilities (the hazard rate) into a function of time (which is the same for all individuals) as well as other regressors. This regression approach allows us to investigate the impact of training on time-to-first-job, controlling for both individual and group differences in age, level of educational attainment, years of prior work experience, and household attributes.

Table 3 presents the cox regression results for males. The estimated coefficient on the indicator variable for training is both positive and statistically significant in all cases, confirming the previous finding that trainees exit unemployment more quickly than their counterparts in the comparison group. The size of this estimated coefficient suggests that the average duration of unemployment for the comparison group is 30 percent longer than that for trainees.

18/ However, a parallel study shows that only age and having economic dependents are significant determinants of unemployment duration in Mexico (Revenga and Riboud, 1993).

Figure 2 plots survival curves for female trainees and non-trainees by age group. Like their male counterparts, female trainees appear to exit unemployment more quickly than females who did not undergo training. At three months, 50 percent of female trainees aged 25 years and under have found employment, as compared to 32 percent of the comparison group. For the sample of young females, these differences disappear over the course of the first year--after nine months the survival curves for trainees and non-trainees are virtually identical. For the sample of older women, the trainee-comparison group difference increases over time so that 75 percent of trainees have left unemployment after 12 months, as compared to 47 percent for older women in comparison group.

We also investigated the employment effects for women with different degrees of attachment to the labor force. If training is enhanced by initial skill or schooling endowments, we might expect training effectiveness to be diminished for women with low attachment to the labor force because of skill obsolescence (Mincer and Ofek, 1982). To explore this hypothesis, we will distinguish between (1) women that worked sometime in the six months prior to training, and (2) those who were out of work for a longer period of time.[19/] Figure 2 shows the survival curves for these two groups of women. In both cases, trainees fared better than those without training. However, consistent with the hypothesis of skill obsolescence, female trainees who recently left employment exited unemployment after training more quickly than trainees who were reentering the workforce after a long inactive spell.

Table 4 presents the results for women of estimating a cox proportional hazards model of unemployment duration for the pooled trainee-comparison group samples. They suggest that differences in exit rates between trainees and the comparison group disappear once account is taken of several individual and household characteristics. The coefficient on the training indicator variable is invariably close to zero. However, this result is due in large part to the differential effects of strong versus weak labor force attachment shown earlier in Figure 2. When an interaction term between training and duration of prior unemployment is included in the cox model, the results suggest that women who entered training after a relatively short spell of unemployment exited more quickly than those who did not undergo training; those who entered training after a long spell out of the labor force exited more slowly.

Employment Probabilities Over Time

19/ In the selection process, preference was given to individuals who had been unemployed for less than three months. However, a number of participants surveyed (females in particular) reported being out of work for a longer period of time. Some women may have been drawn back into the labor force by the training program, and we attempt to flag them under (2).

We also compared the employment probabilities of trainees and non-trainees over progressively longer intervals of time. The ENEU reports the labor market status of the unemployed sample at three, six, nine, and twelve months after the third quarter of 1990 (when we first observe them). For PROBECAT trainees, we use the start and end dates from their retrospective histories to define labor market status variables for comparable intervals of time after the completion of training.

In Tables 5 and 6, we begin with simple comparisons of the employment status of trainees and the unemployed sample without adjustment for program selection effects. These tables show the percent of each group that reports being employed at three, six, nine and twelve months, separately by sex and by prior work experience. Table 5 suggests that trainees, on average, are more likely to be employed during the year following training than the ENEU group. For men, the difference is about 9 percentage points at three and six months, and 5 percentage points at nine and twelve months; for women, the difference between trainees and the ENEU group is somewhat smaller, averaging 4 to 5 percentage points over the year. In Table 6, we differentiate between new labor force entrants and those with previous work experience. These figures suggest that training is much less effective for new entrants. While trainees with work experience are usually more likely to be employed than the comparable ENEU group, trainees without work experience are slightly less likely to be employed at three months, and much less likely at twelve months. A similar, but even more pronounced, pattern is found for the female samples.

This example highlights the importance, in program evaluations, of controlling for group differences in demographic characteristics. As we noted earlier in the methodology section, simple comparisons can be very misleading if trainees differ systematically from the comparison group. In this case, the critical difference between the two groups appears to be a much greater representation of new labor force entrants in the ENEU group. This and other group differences, induced in part by program selection, are explicitly taken into account in the following analyses.

We estimate probit models in which the probability of employment--at three, six, and twelve months--is related to age, schooling, prior work experience, unemployment duration, a set of seasonal dummy variables, and an indicator variable for whether the individual participated in the PROBECAT program. Two different models are estimated. In one specification, no attempt is made to correct for selectivity bias and the model is estimated on the pooled trainee and unadjusted ENEU samples. In the second model, the potential selectivity bias issue is addressed (as before) by pooling trainees with a "matched" comparison group--those unemployed individuals with high predicted probability of program

participation.

The effects of training on subsequent probabilities of employment are summarized in Table 7 for men and women.[20/] First, consider the results for men. The model without selectivity correction suggests that training produces a weak positive effect on the probability of employment at three months, and a zero effect thereafter. Selectivity correction strengthens these results. The corrected estimates show a statistically significant effect of training on the probability of employment at three months, a smaller but still significant effect at six months, but no significant effect thereafter.

For women, a slightly different pattern of employment effects of training is found. The estimates without selectivity correction show that training has no statistically significant impact on the probability of employment. In contrast, the selectivity corrected estimates show a positive, statistically significant training effect, but only in specifications that include dummy variables for different levels of educational attainment. Prior experience also appears to be an important determinant of whether or not training is effective for women. In results not reported here, we find that training has a significantly positive effect on employment at three, six and twelve months for women with prior work experience, but a negative and statistically significant training effect at three and twelve months for those without work experience.[21/]

To summarize, participation in the PROBECAT program appears to impact subsequent employment probabilities of trainees, but in quite different ways for men and women. For males, it increases their probability of being employed up to six months after the program, but does not have an effect thereafter. Taken together with the previous finding that they find jobs more quickly, this result suggests that male trainees tend to be employed for a greater proportion of the post-training period as compared to the comparison group. For women, training appears to raise employment probabilities only for those with prior work experience but, unlike males, this positive training effect persists over the year. In contrast, women without any work experience benefit relatively little, if at all, from training.

20/ The probit regression results on which these estimates are taken are available upon request from the authors.

21/ A substantial proportion of the female trainee sample had no prior work experience. To investigate the potential importance of this variable, we modified the specification of the employment equation to include an interaction term between training and a dummy variable for prior work experience. The results of this model specification are available from the authors.

V. MONTHLY EARNINGS, HOURS OF WORK, AND HOURLY WAGE

The above analysis suggests that PROBECAT training had a positive but moderate impact on the post-training employment rates of participants. The next step is to investigate whether this also translates into an increase in the post-training earnings of participants.

Data and Summary Statistics

The dataset used was constructed from the retrospective PROBECAT survey and two ENEU unemployed cohorts. The first cohort included individuals who were unemployed in the third quarter of 1990 (they are tracked for 12 months). The second cohort included individuals who became unemployed in the fourth quarter of 1990, and were not in the first cohort; for this latter cohort, only nine months of information are available. We pooled all observations reporting positive (and usable) salaries anytime over the period of the PROBECAT survey, and over the 12

(or 9) months interval in the case of the ENEU cohorts.[22/] The dataset thus contains multiple observations on each individual, for every job spell experienced by trainees, and for every quarter in which ENEU cohorts are observed to be employed. The final dataset contains a total of 1,212 trainee-observations and 1,051 comparison-observations for men; the corresponding sample sizes for women are 681 and 300 observations, respectively.[23/]

Means of the three outcome variables for men and women are reported in Table 8, separately for the trainee and comparison samples. On average, male trainees report monthly earnings of 682 thousand pesos as compared to 638 thousand pesos for non-trainees; in other words, earnings that are about 7 percent higher than those of the comparison group. However, higher earnings may partly reflect inflation since trainee salaries include those reported in the first quarter of 1992 while comparison group salaries end in the third quarter of 1991. Trainees also report slightly higher hours of work, 45.8 hours per week as compared to 43.6 hours for the comparison group. Finally, the hourly wage of 3,984 pesos for trainees is slightly lower than the 4,016 pesos estimated for the comparison group.

In the female sample, trainees report monthly earnings that are about 7 percent lower than those of the comparison group: 532 thousand pesos versus 572 thousand pesos, repectively. Like their male trainee counterparts, those that worked did so for three hours a week longer than the comparison group. However, their hourly wage was almost 700 pesos per hour less than the wage received by the female comparison group.

Overall Program Effects

We analyze the separate effects of training on the logarithm of monthly earnings, weekly hours worked, and the logarithm of hourly wages. Each of these outcome measures is regressed on a vector of explanatory variables, including a quadratic measure of potential work experience, level of schooling attainment, prior work experience, unemployment duration at time 0, quarterly dummy variables, and an indicator variable for whether the individual was a participant in PROBECAT training. We also experimented with interaction terms between training and levels of educational attainment to see if

22/ We define usable data as positive monthly earnings less than 5 million pesos, and hours worked less than 85 hours a week.

23/ To accomodate the specific structure of this dataset, we created (and included) two kinds of variables. The first is a variable for the number of months between the date salaries are reported and time 0, which is either the completion of training or the initial date of unemployment for the ENEU cohorts. The second is a set of quarterly dummy variables to account for inflation in salaries over the base period.

training effects vary across different schooling groups (these are reported below).

In this set of analyses, we follow the statistical adjustment suggested by Heckman (1979) to correct for selectivity bias from non-random selection into the training program. As before, we first estimate a probit model relating program participation to the selection criteria for which we have data, namely marital status, number of children, schooling, and time unemployed prior to training. We then use the probit estimates to compute an inverse Mills ratio for all individuals--both trainees and the unemployed comparison group--and include this variable as a regressor in the outcome equations to correct for selectivity bias. This adjustment, however, does not address a potentially important second source of bias--that arising from earnings outcomes being observed only conditional upon having a job. We note, but defer to future research, the difficult task of jointly modelling the two sources of selectivity bias.

Table 9 summarizes the overall impacts of program participation for men and women.[24/] The two columns in Table 9 correspond to different model specifications: (1) simple ordinary least squares regression, and (2) models that correct for non-random selection into the PROBECAT program. The reported coefficients in Panel A and Panel C may be interpreted as the average percentage change in monthly earnings and hourly wage attributable to their participation in the PROBECAT program, respectively; the coefficients in Panel B are the mean changes in weekly hours of work attributable to participation in training.

First, consider the monthly earnings of the male sample. Recall, in the raw data, that male trainees reported monthly earnings that, on average, were 7 percent higher than those of the comparison group. Model specification (1), without selectivity correction for program participation, indicates that the monthly earnings of male trainees are about 12 percent lower than that of the comparison group. This result suggests that the two groups have very different attributes. In model (2), which corrects for selectivity bias (and these group differences), this earnings differential is now reversed. The selectivity corrected estimates show that the monthly earnings of trainees are 17.7 percent higher than the earnings of the comparison group, a difference that is statistically significant.

The results also suggest that training is associated with increased labor supply for the male sample. In the raw data, trainees reported working about two hours more a week as compared to the non-trainees. The hours of work regression without selectivity correction (model 1) reveals no

24/ The full set of results are available upon request.

significant differences in hours worked between the two groups. However, model (2) shows that trainees supply, on average, 7.8 more hours per week than the comparison group once a correction is included for selectivity. Similarly, in the hourly wage results, selectivity correction reduces the negative effect of PROBECAT on hourly wage as compared to model (1). In fact, the final outcome of the selectivity correction is that there is no significant differences in hourly wages between the two groups. Together, these results suggest that training, on average, raises monthly earnings of male trainees through greater supply of hours worked per week, not through higher hourly wages.

A similar pattern of training effects is found for the women. In the aggregate data, women trainees received lower monthly earnings and hourly wages, but worked more hours per week, than the comparison group. In model (1), these program effects on earnings, hourly wage, and hours worked are generally statistically significant. In model (2), however, many of these differences disappear. The only statistically significant effect of PROBECAT is in the results for hours of work, which suggest that women trainees work approximately six extra hours more per week as compared to non-trainees.

Training Effects by Schooling Group

Thus far, we have assumed implicitly that program effects are invariant across different groups of trainees. This may not be a good assumption if the effectiveness of training is shaped by the initial skill endowments which trainees bring to the PROBECAT program. If education helps trainees get more out of training, we would expect training effectiveness to increase (at least over some range) with level of schooling. We address this possibility by including interaction terms between training and indicator variables for each level of schooling attainment. As before, a separate set of dummy variables for each schooling group (except one) is included to control for schooling effects common to both trainee and comparison groups.

Table 10 presents the results of estimating these expanded model specifications for men. To conserve space, we only report results for the models estimated with the selectivity correction. Table 10 suggests that training has positive and statistically significant effects on monthly earnings and hours of work by level of schooling attainment. In general, these earnings and hours effects exhibit an inverted U-shape pattern: being lowest for the least educated males, rising with years of schooling to a peak at the secondary school level (7 to 9 years of schooling), and then declining for the most educated individuals (with post-secondary schooling). For women (not reported here), the schooling-training interaction terms are generally insignificant, suggesting that training effects on these outcomes are

broadly similar across schooling groups.

The results for men--positive impacts on monthly earnings and hours worked but no systematic effect on hourly wage--raise questions about whether training actually increases productivity, in which case one might expect higher hourly wages, or whether it raises earnings by inducing greater work effort among trainees.[25/] We believe the answer lies in the kinds of jobs that trainees find upon completing training. The raw data suggest that a higher proportion of trainees eventually find jobs in large enterprises as compared to the comparison group. For the sample as a whole, employment in large firms is associated with longer hours of work per week and higher monthly salaries, which may partially explain the results that we find. To explore this hypothesis more rigorously, we estimated an ordered logit model for the probability of employment in ten (increasingly larger) firm size categories. As regressors, we included measures of experience, duration of previous unemployment, time dummy variables, and an indicator variable for participation in the PROBECAT program.

Table 11 reports the results for three different model specifications: training by itself, training interacted with a quadratic measure of years of schooling, and training interacted with indicator variables for each schooling level. All three specifications suggest that trainees are more likely to find jobs in larger firms as compared to non-trainees. The fully interacted model specification reveals an inverted-U pattern of effects by schooling group, similar to the previous findings for earnings and hour of work. In short, PROBECAT appears to raise trainees' monthly earnings and hours of work by facilitating their entry into larger firms offering higher pay and more stable, full-time employment. It may achieve this result either by retraining the unemployed in skills for which there is demand, i.e. a matching effect, or by making them more trainable, i.e. providing them with learning skills. PROBECAT may also indirectly impact future earnings potential by placing them in larger firms that tend to provide more on-the-job training.[26/] The trainees will have to be followed over a longer time period for us to verify this hypothesis.

To summarize, the results suggest that participation in PROBECAT increases monthly earnings of male trainees, and that this occurs primarily through their increased hours of work. The disaggregated analyses by schooling reveals that this effect varies with schooling attainment. The effects of training on

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25/ These results do not appear to be specific to Mexico. An anonymous referee points out that similar findings have been reported in evaluation studies of U.S. training programs.

26/ Estimates based upon the 1988 National Employment Survey show that the proportion of workers receiving training in the workplace varies from 5 percent in micro enterprises to 23 percent in large firms employing more than 250 workers.

monthly earnings are largest for those with secondary education (7 to 9 years of schooling). The hours of work effects are large and positive for most groups, except possibly for those with the lowest and highest levels of education. For females, there is some evidence that work hours are increased by training, but these do not translate into higher monthly earnings. Unlike their male counterparts, the earnings and hours effects of training do not vary by level of schooling. The results also suggest that, for males, program participation increases the probability of finding employment in a large firm. Since large firms tend to pay higher wages, provide more training opportunities and thus have steeper earnings profiles, finding a job in a large firm is likely to imply increased earnings opportunities over time for trainees relative to the comparison group.

VI. COST-EFFECTIVENESS OF PROBECAT

What do these findings imply about the cost-effectiveness of PROBECAT? To answer this question we focus on two of the more significant labor market outcomes identified in the previous analyses: first, the impact of program participation on the speed with which trainees find jobs; second, the impact of program participation on monthly earnings. These two impacts, and their implications for the benefit streams associated with program participation, are combined with cost estimates to arrive at some back-of-the-envelope calculations on the cost-effectiveness of PROBECAT.

The costs and benefits are discussed in turn. We include the direct training costs as well as the indirect costs associated with participation in the program. Direct costs (costs for instructors, training materials, and program administration) are readily available from STPS: in 1991, the average operating cost per course completer was about 350.4 thousand pesos. Indirect costs are measured in terms of search time forgone by joining the training program. We assume that at time t_0 each unemployed worker faces two possible strategies: (i) immediately initiate job search (the comparison group); or (ii) enter a training course and thus delay job search by the length of the course (the trainees). From our previous analysis, we know that the duration of search after training is shorter on average than the duration of search for the comparison group (by about 2.5 months). However, we must also take into account costly deferral of search by trainees to participate in PROBECAT. Thus, we calculate indirect costs for trainees by adding to search time the time spent in training (an average of 2.9 months). The benefit measures are calculated from the previous estimates of the effects of training on monthly earnings. Monthly earnings are predicted for trainees and the comparison group using sample means of all regressors.

The top panel of Table 12 summarizes the calculation of these cost and benefit measures. The first two columns show the mean duration of search for the trainee and comparison groups, respectively. The difference between columns (2) and (1) measures the gain in search time (the employment effect) attributable to the program. Column (3) adds the average duration of training (2.9 months) to the search time for trainees. Column (4) reports the total time out of work for the two groups. For male trainees, column (4) shows that participation in PROBECAT increases total time-to-first-job (search+training time) by 0.4 months relative to the comparison group (6.9-6.5 months), while for female trainees, training increases total time-to-first-job by about 1 month.[27/] On the benefit side, column (5) reports the estimated wage effect of training, and column (6) the corresponding predicted monthly wage evaluated at sample means. The positive wage impact attributable to training is quite large for males, averaging about 152 thousand pesos. Although predicted wages for female trainees are slightly higher than for the comparison group, the difference is not statistically significant.

The calculation of net benefits from training is shown in the bottom panel of Table 12. Column (1) shows the direct, average per trainee cost of providing training--350.4 thousand pesos.[28/] Column (2) is the indirect cost of training. This is the monetized value of incremental job search costs (foregone earnings) associated with attending training, valued at the average wage of the comparison group (in other words, the wage trainees would have received had they not participated in PROBECAT). On average, these indirect costs are about 196 thousand pesos for males and 435 thousand pesos for females. Columns (3) and (4) summarize the benefits of training associated with increased wages over three months and over twelve months, respectively. The final two columns show the net benefit (benefits-costs) associated with participation in the training program.

These estimates, though very crude, nonetheless suggest the following findings: for males, the benefits of program participation outweigh the costs within a year of finishing training; for females as a whole, the costs exceed the benefits from training. However, as the previous analyses showed, there are substantial differences in outcomes depending upon whether females enter training with or without prior work experience. For the former group, program benefits from earlier employment clearly offset the costs of participation.

27/ Note, however, that the figure for females hides very substantial differences by demographic group. For females with prior work experience, training reduces their time-to-first-job by 1.1 months (even when we include delayed job search due to training).

28/ The training stipend is not taken into account as it is simply an income transfer and not an economic cost.

VII. CONCLUSIONS

This evaluation of Mexico's PROBECAT program sought to measure the impact of training on employment and earnings of participants. Training outcomes were estimated by comparing PROBECAT trainees to a comparison group of unemployed individuals.

On the whole, the results suggested that PROBECAT was fairly effective in shortening the duration of unemployment for certain target groups, namely the trainees with prior work experience (both males and females). It also appeared to have improved the likelihood of employment for participants over a longer period of time. Compared to those who did not participate in the program, male trainees were more likely to be employed three and six months after training; female trainees with prior work experience also benefited, but unlike male trainees, these positive employment effects appeared to have persisted over a full year. As regards earnings, the evaluation suggested that program participation raised the post-training earnings of men but not women. For male trainees, these earnings effects varied systematically by level of schooling attainment, being greatest for those with 7 to 9 years of schooling. Finally, for both men and women, training induced an increase in the number of hours worked per week.

The disparity of training outcomes across different demographic groups indicated that the unemployed constitute a very heterogenous group and, consequently, that eligibility criteria used for program participation can have important implications for the program's cost-effectiveness. In the specific case of Mexico, the analyses suggested that PROBECAT's selection criteria should be modified to target those demographic groups most likely to benefit from the program, namely, the unemployed with prior work experience, slightly older workers (aged over 25), and those with 6 to 12 years of schooling. For certain other groups--for example, the young, new entrants into the labor force, and those with low levels of schooling attainment--it may be more appropriate for the government to provide adult basic education, facilitate return to school for the young, or introduce firm-based kinds of apprenticeship programs to give new labor market entrants work experience.

More broadly, our study confirmed that program evaluation results can be very sensitive to the way in which training effects are measured. One key source of bias is that arising from non-random selection of participants into the training program. In our evaluation of Mexico's PROBECAT program, we sought to correct for this one source of selectivity bias using a variety of statistical methodologies. Several statistical issues remain, and future evaluations should endeavour to address them both through collection of better comparison group data and through more rigorous econometric modelling. These

evaluations should also focus on other dimensions of PROBECAT not investigated here--training duration, type of training, mix of theory and practice, and the relative effectiveness of different training providers.

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Table 1
Distribution of the Unemployed in 1988

DISTRIBUTION OF UNEMPLOYED BY AGE			
	Men		Women
Age	Standard Definition	Expanded Definition	Standard Definition
12-15	4.2	10.7	2.5
16-20	33.3	33.5	36.6
21-25	24.7	19.3	38.1
26-30	13.3	10.5	
31-40	8.8	9.0	11.7
41-50	8.0	9.5	6.9
51-60	5.1	5.9	2.5
61-70	2.6	1.6	1.7

DISTRIBUTION OF UNEMPLOYED BY EDUCATION LEVEL			
	Men		Women
Years of school	Standard Definition	Expanded Definition	Standard Definition
0	2.4	4.4	1.6
1-5 years	9.7	12.5	8.6
6	16.0	20.0	14.6
7-8	12.9	12.8	8.6
9	20.4	18.8	18.9
10-12	20.2	18.1	35.6
13 and more	18.4	13.4	12.1

Source: Encuesta Nacional de Empleo, 1988.

Table 2

Demographic Characteristics of Trainees and Comparison Group

	Males		Females	
	Trainees	Comparison Group	Trainees	Comparison Group
Age	27.9	25.8	29.0	24.3
% Married	41.2	27.2	45.7	27.2
% Unmarried Couple	3.8	2.6	3.3	4.1
Education:				
Average Yrs School	9.1	8.8	7.8	9.8
Highest level reached:				
No formal	0.1	1.7	0.4	1.5
Primary incomp.	3.4	12.7	9.1	7.7
Primary	13.2	21.5	18.1	16.9
Secondary incomp.	17.5	9.6	24.5	11.8
Secondary complete	30.5	24.1	29.7	16.4
Higher secondary	26.6	13.6	13.8	28.7
University	8.6	13.2	4.3	15.9
% Head of household	42.8	29.4	11.6	5.1
Sample Size	881	371	845	189

Note: The comparison group comprises all unemployed individuals in the 3rd-quarter 1990 Encuesta Nacional de Empleo Urbano (ENEU).

Table 3

Cox Regressions: Men (814 obs)

Dependent Variable:Log (Duration of Unemployment) (months)				
Independent Variables	(1)	(2)	(3)	(4)
Age	-.009 (-1.595)	-0.007 (-1.297)	-.008 (-1.551)	-.007 (-1.261)
Sch	-.016 (-1.370)		-.016 (-1.401)	
Ned		.110 (0.284)		.106 (0.272)
Priminc		-.168 (-0.903)		-.169 (-0.908)
Secinc		-.015 (-0.116)		-.018 (-0.142)
Secc		-.139 (-1.200)		-.137 (-1.184)
Sech		-.031 (-0.262)		-.037 (-0.309)
Coll		-.296 (-1.940)		-.299 (-1.961)
Hhead	.318 (3.233)	.311 (3.154)	.315 (3.203)	.309 (3.135)
Nohijos	-.011 (-0.349)	-.008 (-0.269)	-.012 (-0.394)	-.010 (-0.307)
Wkexp0	.737 (5.593)	.742 (5.612)	.777 (5.565)	.775 (5.538)
Trainee	.355 (4.101)	.340 (3.840)		
Trainee1			.395 (4.034)	.373 (3.739)
Trainee2			.321 (3.380)	.312 (3.215)

Independent Variables

- Age
- Sch=years of schooling
  Ned=1 if no formal education, =0 otherwise
  Priminc=1 if incomplete primary, =0 otherwise
  Secinc=1 if incomplete secondary, =0 otherwise
  Secc=1 if complete secondary, =0 otherwise
  Sech=1 if higher secondary, =0 otherwise
  Coll=1 if college, =0 otherwise
- Hhead=1 if household head, =0 otherwise
- Nohijos=number of children
- Wkexp0=1 if prior work experience, =0 otherwise
- Trainee=1 if program participant, =0 otherwise
- Trainee1=1 if program participant and unemployed 6 months or less
- Trainee2=1 if program participant and unemployed less than 6 months

Table 4

Cox Regressions: Women (599 obs)

Dependent Variable: Log (Duration of unemployment) (months)				
Independent Variables	(1)	(2)	(3)	(4)
Age	-.014 (-1.866)	-.014 (-1.867)	-.011 (-1.467)	-.011 (-1.481)
Sch	.005 (0.300)		.004 (0.240)	
Ned		.949 (1.305)		.876 (1.208)
Priminc		.042 (0.212)		.024 (0.119)
Secinc		-.017 (-0.115)		-.041 (-0.276)
Secc		-.074 (-0.490)		-.109 (-0.727)
Sech		.125 (0.787)		.123 (0.769)
Coll		.043 (0.187)		-.0002 (-0.001)
Hhead	.399 (2.970)	.390 (2.881)	.457 (3.427)	.449 (3.343)
Nohijos	-.002 (-0.056)	-.007 (-0.203)	.006 (0.160)	-.0002 (-0.007)
Wkexp0	.507 (4.731)	.506 (4.713)		
Trainee	.012 (0.098)	.071 (0.543)		
Trainee1			.236 (1.631)	.314 (2.078)
Trainee2			-.153 (-1.175)	-.083 (-0.608)

See Table 3 for definitions of independent variables.

Table 5

Employment Outcomes for Trainees versus Unemployed Group (ENEU)

Expanded Definition of Unemployed*

	Males		Females	
	Trainees	ENEU Group	Trainees	ENEU Group
% EMPLOYED				
3 months after	60.0	51.0	33.0	29.0
6 months after	65.0	56.0	38.0	32.0
9 months after	66.0	61.0	38.0	34.0
12 months after	71.0	65.0	39.0	35.0
DIFFERENCE BETWEEN CHANGES FOR TRAINEES AND ENEU GROUP				
after 3 months	9.0		4.0	
after 6 months	9.0		6.0	
after 9 months	5.0		4.0	
after 12 months	6.0		4.0	

Note: * Unemployed defined as those who are not working, not studying, not retired (under 55), able to work (not sick or disabled),regardless of whether actively searching for job or not. Women who report being at home taking care of the house are NOT counted as unemployed. Sample sizes are 1138 and 1000 for males and females, respectively.

Table 6

Employment Outcomes for Trainees versus Unemployed Group (ENEU)

Males

	Trainees		Unemployed ENEU Group	
	With work experience	No work Experience	With work experience	No work experience
PERCENT EMPLOYED:				
3 months after	65.0	32.2	60.0	34.6
6 months after	70.6	35.7	69.8	33.1
9 months after	71.2	37.4	73.2	40.4
12 months after	76.4	40.9	74.5	49.3
DIFFERENCE BETWEEN CHANGES FOR TRAINEES AND ENEU GROUP:				
after 3 months	5.0	-2.4		
after 6 months	0.8	2.6		
after 9 months	-2.0	-3.0		
after 12 months	1.9	-8.4		

Females

	Trainees		Unemployed ENEU Group	
	With work experience	No work experience	With work experience	No work experience
PERCENT EMPLOYED:				
3 months after	43.3	15.1	32.4	23.8
6 months after	50.0	17.4	35.2	28.6
9 months after	50.0	19.0	33.3	34.5
12 months after	50.2	21.6	34.3	36.9
DIFFERENCE BETWEEN CHANGES FOR TRAINEES AND ENEU GROUP:				
after 3 months	10.9	-8.7		
after 6 months	14.8	-11.2		
after 9 months	16.7	-15.5		
after 12 months	15.9	-15.3		

Table 7
Estimated Training Effect on Employment[a]

Males

	Difference in Predicted Emp. Probabilities (specification with education dummies)		Difference in Predicted Emp. Probabilities (specification with continous school variable)	
	Uncorrected (1)	With selectivity[b] (2)	Uncorrected (1)	With selectivity[b] (2)
After 3 months	.055*	.084**	.072**	.098**
After 6 months	.011	.055*	.033	.077**
After 12 months	.008	.042	.015	.050
Sample Size	1138	943	1138	943

Females

	Difference in Predicted Emp. Probabilities (specification with educationn dummies)		Difference in Predicted Emp. Probabilities (specification with continous school variable)	
	Uncorrected (1)	With selectivity[b] (2)	Uncorrected (1)	With selectivity[b] (2)
After 3 months	.048	.089**	.052	.054
After 6 months	.069**	.130**	.055	.066*
After 12 months	.061*	.109**	.053	.056
Sample Size	1000	916	1000	916

a Difference between predicted employment probabilities due to participation in training. Column (1) is based on probit model estimated on the pooled trainee and ~~unadjusted~~ ENEU groups. Column (2) is based on probit model with selectivity correction.

b The "matched" comparison group selected from the ENEU sample according to selection criteria used for trainees.

* Near-Significant (.10) ** Significant (.05)

Table 8

Monthly Salary, Hours Worked, and Hourly Wage for Trainees and the Comparison Group

Sample Outcome variables	Trainees	Comp. Group
A. Male Samples (number of observations)	1212	1051
Monthy salary (1,000 pesos)	681.59	637.67
Weekly hours worked	45.81	43.59
Hourly wage (1,000 pesos)	3.984	4.016
B. Female Samples (number of observations)	681	300
Monthy salary (1,000 pesos)	531.85	571.52
Weekly hours worked	42.77	39.51
Hourly wage (1,000 pesos)	3.476	4.198

Table 10

Effects of Training on Earnings, Hours of Work, and Wages
Selectivity Corrected Estimates -- Males

Explanatory Variables	OLS Estimates		
	Log Monthly Salary	Weekly Hours Worked	Log Hourly Wage
Constant	5.726 **	42.587 **	.574 **
General experience	.023 **	.134	.019 **
Experience-squared	-.000 **	-.004 **	-.000 **
Schooling Attainment Level:			
No Education	-.203 **	-1.024	-.194
Primary-incomp.	-.005	-.797	.003
Secondary-incomp.	.062	.430	.026
Secondary-comp.	.165 **	-1.790	.186 **
High school	.279 **	-.704	.295 **
College	.571 **	-.455	.555 **
Training x School Interaction:			
No Education	-.058	14.820	-.485
Primary-incomp.	-.063	9.101 **	-.270 **
Primary-comp.	.212 **	8.409 **	-.002
Secondary-incomp.	.267 **	5.424 **	.161
Secondary-comp.	.199 **	10.132 **	-.039
High School	.171 *	7.848 **	-.029
College	.045	2.769	.032
Inverse Mills Ratio	-.179 **	-4.650 **	-.049
R-squared	.157	.054	.145
Sample size	2330	2271	2271

1. Regressions included duration of previous unemployment, self employed status, and time dummy variables.
2. * and ** denotes statistical significance at the 5 percent and 1 percent levels, respectively.

Table 11

Probability of Post-Training Employment in a Larger Firm (Men)

Dependent Variable: Firm Size Categories 1-10			
Explanatory Variables	Maximum Likelihood Ordered Logit Estimates		
	(1)	(2)	(3)
Schooling Attainment:			
No education	-.262	-.163	-.229
Primary-incomp.	-.014	.102	-.051
Secondary-incomp.	.289 **	.236 *	-.092
Secondary-compl.	.202 *	.189	.095
High School	.517 **	.633 **	.541 **
College	.482 **	.986 **	.845 **
PROBECAT Trainee			
Trainee (1,0)	.786 **		
x Schooling		.246 **	
x Schooling-squared		-.017 **	
x No education			-.236
x Primary-incomp.			.827 **
x Primary-comp.			.707 **
x Secondary-incomp.			1.314 **
x Secondary-comp.			.893 **
x High School			.688 **
x College			-.057
Inverse Mills Ratio	-.354 **	-.282 **	-.338 **

1. Sample of 2330 observations. Regressions included quadratic specification of general experience, the duration of previous unemployment, and time dummy variables.
2. * and ** denotes statistical significance at the 5 percent and 1 percent levels, respectively.

Table 12
Evaluation of Labor Retraining Program

Summary of Program Effects

Trainee Type	Average Duration of Search (months)		Trainees:Time to Job = Search + Trg Period[1] (3)	Time to Job Trainees - Controls (4)	Wage Effect[2] $LnW_t - LnW_c$ (5)	Predicted Monthly Wage[3] ('000s) (6)	
	Trainees (1)	Controls (2)				Trainees	Controls
Males	4.0	6.5	6.9	0.4	.27*	642	490
Females	5.9	7.8	8.8	1.0	.02	444	435

Net Benefits By Type of Trainee

Trainee Type	Costs of Training		Benefits: Increase in Monthly Wage ('000s)		Net Benefits - Costs ('000s)	
	Direct Trg Costs (000s) (1)	Search Costs[4] (000s) (2)	Over 3 months (3)	Over 12 months (4)	Over 3 months (5)	Over 12 months (6)
Males	350.4	196.0	456.0	1,824.0	-90.4	1,457.6
Females	350.4	435.0	27.0	108.0	-758.4	-677.4

* Significant at 10% level
** Significant at 5% level
[1] Average duration of training period = 2.9 months.
[2] Equals the coefficient on the training variable from a regression of log monthly wages on experience, experience squared, schooling, quarterly dummies, self-employment status, duration of unemployment prior to time t0, whether with prior work experience, and interactions for training and schooling status, and for training and age (see text).
[3] Predicted monthly wages at sample means from the same wage regression.
[4] Equals the additional time trainees take to find a job because of training times the opportunity cost of that time, which equals the comparison group wage, i.e. the wage trainees would have received without training.

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