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Training Vouchers and Labor Market Outcomes in Chile *

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Abstract

This paper evaluates the impact of the Bono Trabajador Activo, a training voucher program in Chile, on workers' labor market outcomes. Using detailed administrative datasets of the National Employment Service and the Unemployment Insurance System, we apply difference-in-difference and IV estimators to measure these effects. Our main results indicate that the voucher program has an overall negative impact on employment and earnings, particularly among individuals who expect to change economic sector. In contrast, we find that the program improves labor outcomes for females, particularly for those with lower education. The voucher program also improves employment duration and mobility across economic sectors.

JEL Codes: J24, J68, H43.

Keywords: active labor market policy, training vouchers, program evaluation

1 Introduction

The introduction of vouchers in public policies is one of the most significant and controversial reforms undertaken in recent decades. Despite the fact that governments commonly use vouchers as instruments for increasing access to public services—particularly to education—their use in the context of labor training is

*The study used the Unemployment Insurance database. We thank the Department of Employment of the Chilean Ministry of Labor and Pensions for the dataset access. The results and opinions expressed in the publication are those of the authors, and do not necessarily reflect the views of the Inter-American Development Bank or the Ministry of Labor and Pensions. All the information utilized in this paper was kept anonymous. We do not use any data with individual indicators. The data were stored and managed in a secure server. We thank Paulina Sepúlveda for her excellent work in preliminary versions of the paper. We also appreciate the helpful comments of Mariano Bosch; Cristobal Huneeus; Carmen Pages-Serra; seminar participants at the Inter-American Development; and conference participants at the 28th European Society for Population Economics (ESPE), the 26th European Association of Labor Economics (EALE), the 9th IZA/World Bank Conference entitled "Employment and Development", and the 19th Latin American and Caribbean Economic Association (LACEA).

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more recent. This paper examines the impact of a labor training voucher, the Bono Trabajador Activo (BTA), on labor market outcomes of workers in Chile. To the best of our knowledge, this is the first study in a developing country that evaluates these effects.

The economics literature suggests different ways through which training vouchers may affect labor market outcomes. On the one hand, vouchers are expected to increase the set of consumers' (workers, in our case) choices, which might increase competition among providers of labor training. More competition between these providers might reduce inefficiencies in the delivery of training, which is expected to improve labor outcomes. Moreover, vouchers might allow workers to choose training providers according to their own preferences. This flexibility is expected to lead to better matches between workers and training providers, which might also increase the effectiveness of the training. On the other hand, it is also possible that asymmetries of information could cause workers to use vouchers for training that is not completely in accordance with their preferences or that might have lower returns in the labor market.

Although the literature has focused extensively on school vouchers (Angrist et al. 2002; Bettinger, Kremer, and Saavedra, 2010; Epple and Romano, 1998; Figlio and Page 2002; Hanushek et al. 2007; Hoxby 2003; Hsieh and Urquiola 2006; among others), less attention has been given to labor training vouchers (Doerr et al. 2014; Rinne, Uhlendor, and Zhao, 2008). None of the papers on training vouchers offers evidence of the effects of labor training vouchers in developing countries. The main objective of this paper is to contribute with new evidence on the impact of a recent implemented labor training voucher on labor outcomes in Chile.

Chile represents an interesting case among developing countries (OECD, 2011). In the last two decades, the country has experienced both strong economic growth and accelerated poverty reduction. [1] The unemployment rate is still high among the poor (17 percent among the poorest quintile compared to 8 percent at national level), however, and inequality is substantial (Chile has a Gini index of 0.52 compared to an average of 0.32 for the OECD countries).[2] With the aim of improving those two indicators and achieving the standard of living of developed economies, Chile has prioritized policies in recent years designed to increase investment in human capital accumulation and improve productivity. In particular, the country has implemented policies to improve the education system.[3] Certain policies are still in progress, however, such as those aimed at improving the labor training system, with the goal of increasing worker productivity by tailoring training programs to the needs of the productive sector.

Previous analyses of the training system in Chile find low coverage among salaried workers with low productivity (SENCE, 2010). Evaluations of the Franquicia Tributaria (FT)[4] indicate that the mechanism is almost exclusively reach-

[1] According to the National Socioeconomic Characterization Survey, (CASEN), the poverty rate decreased from 39 percent in 1990 to 15 percent in 2011.

[2] Income inequality in Chile is the highest among the OECD countries (OECD, 2012).

[3] For instance, Chile is progressively increasing the public spending on education, and has established secondary education as compulsory since 2003.

[4] FT is a subsidy for firms investing in off-the-job training programs for their workers. This

ing workers in medium and large companies (Rodriguez and Urzúa, 2012), as well as workers with high productivity.[5] Furthermore, an analysis of the Chilean training system revealed the absence of public instruments allowing workers to express their preferences regarding the demand for labor training services (Consejo Asesor Presidencial Trabajo y Equidad, 2008).

To overcome these shortcomings, in 2011 Chile implemented a series of measures to strengthen its training system, including the BTA program. In terms of budget, the BTA represents the second largest program of the National Training and Employment Service (Servicio Nacional de Capacitación y Empleo, or SENCE).[6] In 2011, the BTA budget was US$32.3 million (approximately 16.2 billion Chilean Pesos [CLP]), representing 15 percent of the total resources allocated to SENCE during that year (Ministerio de Hacienda, 2010).[7] The BTA's main objective is to increase the earnings and job mobility of workers by addressing their training needs. The BTA consists of a grant that allows beneficiaries to choose the subject (from a list predefined by SENCE) and location of the labor training.

This paper uses administrative data from different sources to evaluate the impact of the BTA on individual labor outcomes. First, we use data from the Unemployment Insurance (UI) dataset, containing employment and earning histories of formal workers since 2002. The UI dataset contains monthly information from about 7.7 million formal workers. Second, we merge the UI dataset with administrative data from SENCE, containing information about BTA applicants (205,823 workers in 2011).[8] The rich nature of these datasets allows us to use panel data models for evaluating the impact of training on earnings and employment probability. Moreover, using administrative data of BTA applicants allows us to restrict our sample to individuals sharing unobservable characteristics, such as motivation. Given the non-experimental setting, we form a control group with individuals whose probabilities of undertaking training are similar to the ones of those who ended up using the BTA. Then, we compute a difference-in-difference model to measure the effects of the program on different labor outcomes. Finally, to account for the potential selection into treatment based on unobservable characteristics, we employ an instrumental variable (IV) approach.

Overall, our results indicate a negative and small impact of the BTA on employment and earnings, particularly among individuals with expectations of changing economic sectors. We also find evidence of heterogeneous effects, fa-

subsidy functions in a highly competitive system in which private providers offer training courses to firms in a massive industry of courses. Courses financed by FT cover 84 percent of all public related training courses. Trained individuals under FT represent 12 percent of all employed individuals in Chile. FT also funds internal courses for firms and training instructors.

[5] The FT mainly benefits workers with higher incomes and education. The main users of the FT are administrative and highly skilled workers (61.3 percent of the total workers). They pay training completely or partially with the FT (SENSE, 2011).

[6] SENCE's largest program in terms of budget is the Subsidio al Desempleo, which had a budget of US$83 million in 2011 (approximately 41.5 billion CLP). It is important to note that the BTA has suffered important reduction in its budget allocation since its implementation.

[7] The exchange rate used throughout this paper is the 2011 average of US$1 = 477 CLP.

[8] That is, workers who: (i) applied to the program in 2011; (ii) were awarded a voucher; and (iii) decided to finally use it or not to engage in a training course.

voring females and less educated individuals. Finally, we find evidence of a positive impact on employment duration and mobility across economic sectors.

The rest of the paper is organized as follows. The next section provides a literature review on voucher training programs. Sections 3 and 4 describe the BTA program and research strategy implemented, respectively. Section 4 describes the data used, and Section 5 presents the results. Section 6 concludes and offers policy recommendations.

2 Training Vouchers

According to the economics literature, using vouchers as a public policy tool improves economic efficiency in two ways (Friedman, 1962). First, it is expected that well-informed workers are able to choose the training programs that will maximize their individual well-being and hence social welfare as a whole. Second, expanding the set of workers' choices is expected to increase competition among training providers, which potentially improves the quality of the training received.

An underlying assumption of these theoretical advantages is that individuals are well informed. When individuals are poorly informed about their own abilities, the quality of the training provider, or the expected wages and employment prospects in the occupation for which they are training, however, the efficiency of vouchers might be at risk (Barnow, 2009). To overcome this potential risk, and considering that gathering information might be expensive for individuals with low levels of human capital, an alternative scheme to the one allowing individuals to choose a free training program is to request information from local workforce agencies or to ask workers to demonstrate knowledge about their decision before training takes place (Steuerle, 2000).

The efficiency gains of vouchers are also at risk when the training level maximizing individuals' well-being does not maximize the well-being of the society as a whole. There are several reasons why individuals might not choose efficiently from a social point of view. For instance, although public policies of this kind aim to maximize earnings, workers might select training programs that increase their current income and not necessarily their future income, as it is socially desired (Barnow, 2009). Moreover, workers might choose training as a response to non-pecuniary incentives (e.g., social pressure, norms, etc.).

Vouchers have been extensively used as a public policy tool, particularly in education (Steuerle, 2000). Some countries (e.g., Chile, Denmark, the Netherlands, South Korea, and Sweden) have implemented universal voucher programs in education, while others have implemented programs targeted toward specific geographical areas (e.g., Cote d'Ivoire and Czech Republic) or groups of the population (e.g., Colombia, Guatemala, Pakistan, and the United States).

The theoretical and empirical evidence of the impact of school choices on students' performance is vast and mixed. For instance, several small-scale voucher programs for private education—mostly targeted to low-income students—have been implemented in the United States, such as the Milwaukee Parental Choice

Program, the Cleveland Scholarship and Tutoring Program, the Washington D.C. Opportunity Scholarship Program, and the New York City Voucher Experiment. In general, these programs have had modest effects on students' education achievements.[9] Evidence from Denmark suggests that the increase in competition between providers, generated as a response to the voucher system, does not affect educational outcomes of students. In contrast, competition positively affects the performance of Swedish public schools and of both private and public schools in the Netherlands (Barrera Osorio and Patrinos, 2009). For Chile, several evaluations of the education voucher system, using different methodologies and datasets, find a small positive effect on education outcomes (Contreras, Elacqua, and Salazar. 2008; Lara, Mizala, and Repetto, 2011; McEwan, 2001; Sapelli and Vial, 2002; Sapelli and Vial, 2005; Tokman 2002).

Despite the fact that many developed countries have already introduced training vouchers programs (e.g., Australia, Belgium, Germany, the Netherlands, and the United States), their use has received much less attention in the empirical economics literature. In the United States, many programs, operating at a state and local level, utilize vouchers in the provision of education, training, and employment services. Barnow (2009), in its comprehensive review of the use of vouchers in targeted training programs in the United States, concludes that the empirical evidence is mixed. The design of the voucher program and the accompanying services seem to determine the effects. For instance, evidence from the Seattle-Denver voucher experiment shows that the program increased the amount of training and education received while negatively affecting earnings of those eligible to participate. [10] The evaluation of the Individual Training Account Experiment finds similar results. Participants declared that having more choices as a consequence of the program was an advantage, but empirical results suggest that the program generated losses in terms of earnings.[11]

There is also evidence on the effectiveness of vouchers for dislocated workers.[12] Evidence from the Trade Adjustment Assistance program shows that individuals receiving training had slightly lower wages than those who did not, but the difference was generally not statistically significant.[13] Meanwhile, the

[9] Barrera Osorio and Patrinos (2009), Belfield and Levin (2002), Levin and Beleld (2003), McEwan (2004), Rouse and Barrow (2009), Somers, McEwan, and Willms (2004) provide a review of the literature on the impact of private school vouchers.

[10] The Seattle-Denver program was the largest and last of a series of experiments that were conducted in the 1960s and 1970s to learn about the feasibility and behavioral implications of a "negative income tax" program. The program provided members of the treatment group a guaranteed income, which was taxed at a specified rate. The experiment involved almost 5,000 families, which were randomly assigned to one of the four basic combinations: (i) counseling only; (ii) counseling plus a 50 percent subsidy for the cost of any education or training; (iii) counseling plus a full subsidy for the cost of any education or training in which the person enrolled; and (iv) no treatment. See Dickinson and West (1983), for further details.

[11] The Individual Training Experiment Account was implemented to learn the relative effectiveness of individual training accounts, with different levels of control by local programs. See McConnell et al. (2006) for further details.

[12] In the United States, the terms "dislocated workers" and "displaced workers" are use synonymously. Displaced workers refers to workers 20 year of age and older who have lost or left their jobs because either their company closed or moved, there was insufficient work for them to do, or their position or shift was abolished.

[13] The Trade Adjustment Assistance program was established in 1962 to provide financial assistance and training to workers who lost jobs as a result of imports. See Corson et al.

evidence from the voucher program funded by Allegheny County, Pennsylvania finds that the program increased earnings by about 6.3 percent.[14]

For Switzerland, Schwerdt et al. (2011) evaluates the effects of issuing vouchers for adult education through a randomized intervention. The authors find no significant average effect of the program on earnings, employment, and subsequent education one year after the treatment. They find evidence of heterogeneous effects, however: among the group of individuals that change their decision about participating in adult education in response to the voucher, substantially more individuals have higher than lower education levels. On the other hand, returns to adult education, in terms of future earnings, are higher for individuals with less education than for individuals with more; that is, those who would benefit the most from the program seem not to take advantage of it.

For Germany, Rinne, Uhlendor, and Zhao (2008) analyze the impact of the Hartz reform implemented in 2003, which introduced training vouchers and imposed more selective criteria on the applicants. Using rich administrative data and applying matching and regression methods, the authors first estimate the overall reform effect and then decomposes it into a voucher effect and an assignment effect. They find positive effects of the voucher on employment, measured 6 and 12 months after starting in the program. Also for Germany, Doerr et al. (2014) estimate the average causal effect of the voucher on the employment probability and monthly earnings for individuals who were awarded a voucher. The authors find positive effects on employment and earnings after a lock-in period of four years. Their results indicate that after four years of being awarded a training voucher, recipients are 1 to 2 percentage points more likely to be employed, but they earn less than comparable non-recipients.

As mentioned above, experiences of labor training vouchers programs in developing countries are scarce. In Kenya, the World Bank launched a training voucher program for entrepreneurs in micro and small enterprises (MSEs). The voucher covered up to 90 percent of the cost of skill and management training. Results from an ex-post evaluation, which surveyed over 300 training providers and MSE trainees, suggest that the program's impact on training was modest. The training providers, rather than the trainees, captured a large share of the voucher subsidy. Moreover, many trainers returned to their previous activities once the subsidies ended (Hallberg, 2006). Similarly, a program implemented in Paraguay in 1995 increased the demand for training (Schor and Alberti, 1999).[15] Unfortunately, these two studies do not analyze the effect of the voucher on workers' labor outcomes.

The empirical literature presented in this section shows mixed results of the impact of the training vouchers on education and labor market outcomes. Furthermore, the magnitude of the impact is generally small. In particular, it is unclear whether a training voucher scheme is more efficient than a scheme in

(1993) for further details.

[14] This program targeted dislocated workers. See Bednarzik and Jacobson (1996) for further information.

[15] The Training Voucher Program in Paraguay works as following: entrepreneurs obtain vouchers in government offices and attend training courses of their choice. Participants pay for courses with the vouchers and individual contributions. The only restriction is an institution recognized by the program must provide the training.

which the government or its agents make the training assignments, or than any other active labor market policy.

3 The Bono Trabajador Activo (BTA)

Despite the significant economic development observed in Chile during recent decades, inequality is still persistent. Chile has the most unequal distribution of income among OECD countries (OCDE, 2012), and one similar to the average of the Latin American region (López-Calva and Lustig 2010).[16] The main source of household income (80 percent) in Chile comes from labor income (CASEN, 2009), which suggests that this is an important component related to inequality in the country. Moreover, workers in Chile exhibit an important deficit of basic skills. For instance, according to Centro de Microdatos (2013), 44 percent of adults in Chile are functionally illiterate (42 percent in reading comprehension and 51 percent in basic quantitative skills). There is a consensus in Chile that investing in human capital accumulation and productivity would lead to better labor conditions for workers, which would contribute to increasing the living standards to the level of developed countries (Consejo Asesor Presidencial Trabajo y Equidad, 2008).

At the beginning of 2011, Chile implemented the BTA to address the low levels of employability of particular groups of workers and increase their access to better quality jobs. The BTA, managed by SENCE, consists of a grant that allows workers to choose labor training courses from a predefined list. The courses take place at technical training organizations (OTECs, for its acronym in Spanish). To be eligible for the voucher, applicants must be employed; be at least 18 years old and no more than 60 for women and 65 for men; have contributed to social security at least 12 months (continuously or discontinuously) during their professional lives; have contributed at least 6 months (continuously or discontinuously) during the year prior to the application; and, have, on average, a monthly gross wage lower than US$1,200 (CLP 600,000).[17] Administrative data to confirm eligibility is verified through different public institutions (the Civil Registry and Identification Service; the Social Welfare Institute; and the Unemployment Fund Administrator; among other sources).[18]

By design, the training courses last between 80 and 140 hours (distributed, on average, over a 6-month period).[19] In general, the maximum BTA funding amounts to US$800 (approximately CLP 400,000) per beneficiary. For more expensive courses, the funding might increase up to US$1,000 (CLP 500,000). Before the training starts, the beneficiary is asked to pay 20 percent of the total course fees. This initial copayment is designed as a guarantee, which is

[16] The average Gini index among the OECD countries is 0.32, while in Chile it is 0.52. The average Gini of Latin America is 0.51.

[17] Based on the average calculated over the 12 months prior to the application.

[18] The employment status data of the applicants is verified through administrative data from the Ministry of Labor. Delays in updating the data might allow unemployed workers to receive the BTA.

[19] This might vary with the type and number of weekly hours of the training chosen. In practice, the average length of the courses is 58 days (see Figure 3A in the Appendix for the distribution of length).

reimbursed to the beneficiary at the end of the course if he or she attends at least 75 percent of the training, passes the course, and completes a satisfaction survey.[20] If these conditions are not met, the OTEC may retain the copayment.

Originally, the BTA was designed to sort eligible workers according to an employability index (EI).[21] The workers with the lower scores were to be given priority in receiving the vouchers. In practice, however, the EI was never used. Although the EI was designed as a targeting mechanism, it was not used during the first year of the program because of the expected low demand for vouchers. Instead, all eligible applicants were awarded training vouchers, subject to availability of slots in each course. This assignment mechanism has a direct impact on the evaluation methods used, as discussed later herein.

4 Empirical Strategy

This section presents the empirical strategy for estimating the effect of the training vouchers on the labor outcomes of workers. The non-experimental feature of the data determines the methodology used.

Despite the fact that all applicants fulfilling the eligibility requirements were offered a voucher, only 25 percent enrolled in a training course. Among the people who did not use the voucher are those who: (i) were unable to enroll in an OTEC given the existing slots for each region; (ii) decided not to enroll because the course of their choice was not offered; and (iii) did not enroll in an OTEC for some other unspecified reason. Unfortunately, we are unable to observe which of these reasons determined the lack of participation.

Therefore, given that all eligible applicants were offered a BTA voucher, the treatment group includes only those applicants who were awarded a voucher and enrolled in a training course. The control group consists of those applicants who were awarded a voucher but did not take a training course. Since we do not have data on dropouts for the entire sample, the treatment group may include individuals who started but did not complete the training courses. This suggests that our estimates would underestimate the true impact of the BTA.

Because individuals using and not using the voucher might differ in some other features, we first estimate the probability of using the BTA voucher on a set of observable characteristics and keep in the sample those who shared a common support (73 percent), as shown in Figure 2A in the Appendix. Then, we exploit the longitudinal setting of the data and evaluate an individual fixed

[20] After completing the course, students must answer a satisfaction survey provided on SENCE's website. The surveys were not conducted in 2012 and 2013 due to problems in its implementation.

[21] The employability index (EI) was defined as:

$$IE_i = \overline{S_i}\frac{Months_i}{12}$$

where $\overline{S_i}$ corresponds to the average monthly earnings in the 12 months prior to the application. This average is represented in Unidades de Fomento (UF), the account unit used in Chile. The exchange rate between the UF and the CLP is constantly adjusted to inflation so that the value of the UF remains constant on a daily basis during low inflation. $Months$ is the number of months with formal employment in the 12 months prior to the application.

effect model to estimate the effect of the voucher on employment and earnings. The difference-in-difference approach allows us to control for time-invariant unobservable characteristics (e.g., ability and motivation) that might affect both participation in the treatment and labor outcomes. Finally, to account for the potential selection into treatment based on unobservables, we estimate an IV model.

4.1 Regression Models

We start estimating the propensity score of starting versus not starting a training course using a probit model:

$$P_i^* = \alpha + \beta X_i + \epsilon i \tag{1}$$

where P^* is a latent variable that determines the observed outcome p under the following rule:

$$p_i = \begin{cases} 0, P_i^* \leq \overline{p} \\ 1, P_i^* > \overline{p} \end{cases}$$

This procedure allows us to define an overlap region or common support conditionally on X. We apply a Minima and Maxima approach to delete all observations whose propensity score is smaller than the minimum and larger than the maximum in the opposite group (control or treatment). The set of variables in X includes variables fixed over time as well as variables that were measured before the start of training.

Considering this restricted sample, we estimate the effect of the BTA using the following model:

$$y_{it} = \alpha + \beta D_{it} + \delta X_{it} + \tau_i + \lambda_t + \epsilon_{it} \tag{2}$$

where y_{it} is the labor market outcome of interest for individual i in month t. X_{it} is a vector of time-variant individual characteristics (age and age squared). On the other hand, τ_i is the individual fixed-effect and λ_t is the time (months) fixed-effect. D_{it} is a dummy indicator for whether individual i effectively undertakes training using the BTA. For these individuals, D takes the value of 1 when they start training and maintains a value of 1 until June 2014, which is the last month that we observed the individuals.

Assuming that (i) the control group adequately represents the trajectory of the treatment group in the absence of the program (parallel trends assumption) and (ii) the treatment effect is homogeneous, the coefficient β in equation (2) represents the impact of the BTA on the corresponding labor market outcome.

The parameter of interest, β, in equation (2) is estimated by a Fixed-Effects (FE) model. The key identifying assumption is that, in the absence of the BTA, changes in earnings or employability would not systematically be different between workers in the treatment and control groups. Under this assumption, the parameter of interest β represents the average effect of BTA on trained workers compared to workers who did not use the voucher. We also, explore heterogeneous effects by gender and education.

To test whether the common trend assumption is likely and analyze the treatment effects over time, we estimate the following model:

$$Y_{it} = \tau_i + \lambda_t + \sum_{j=-q}^{-1} \beta_j D_{ij} + \sum_{j=0}^{m} \beta_j D_{ij} + \delta X_{it} + \epsilon_{it} \tag{3}$$

where we include q "lags" and m "leads" of the treatment effect so that the treatment effect β in equation (2) might be decomposed into the treatment effect on the jth lag or lead. If the common trend assumption is valid, we expect the β_j's coefficients be close to zero for all $j < 0$.

Finally, to account for the potential selection into treatment based on unobservable characteristics, we estimate an IV model. We use as IV the number of months between the time the BTA voucher was awarded and the time an individual approaches the OTEC to register for a training course. We expect that this timespan affects the corresponding labor market outcome only indirectly through its effect on the probability of participation (i.e., enrollment into a training course using the BTA). Given the time-invariant nature of this IV, we are not able to use panel data. Therefore, we estimate IV models for each month after the time of treatment.

5 Data and Summary Statistics

This section provides descriptive statistics on individual characteristics and the outcome variables. We use data from different sources to estimate the effect of the BTA on labor market outcomes. First, we use administrative data from SENCE containing information on BTA applicants. Second, we use data from the Chilean UI system, which is administered by the Unemployment Fund Administrator, and contains data from all formal dependent workers since 2002.[22]

The administrative data from SENCE contains information on BTA applicants since 2011. For every voucher received, it is possible to identify the starting and ending dates of the corresponding training course (see Figure 1A in the Appendix). Most courses (98 percent) started between August 2011 and May 2012 and finished between October 2011 and July 2012 (95 percent). The average length of the courses was 58 days (see Figure 3A in the Appendix). According the administrative data from SENCE, there were 205,823 applicants for the BTA in 2011. As mentioned above, all applicants fulfilling the application requirements had the same probability of receiving a voucher, subject to the availability of open slots.

The UI system provides a detailed administrative dataset containing, as of June 2014, information on the gross monthly earnings of 7,75 million formal workers since October 2002. It contains information on gender and age, as well as the economic sectors and regions of the firms. Combining the UI data and

[22]The Unemployment Insurance is an individual saving account for each dependent worker. Both the worker and his employer contribute to this fund. The UI is supplement by the Solidarity Fund, which is financed by public and private (employers) contributions. The Unemployment Fund Administrator of Chile (AFC) is the private manager of the mandatory unemployment insurance.

the records of beneficiaries of the BTA, we ended up with a sample of 198,187 workers.[23] Even though all applicants were supposed to fulfill the eligibility requirements described above, we find some contrasting evidence in the data. Regarding the employment status requirement, 15 percent were not actually employed at the time of the application. Moreover, 8 percent of the applicants had contributed to social security fewer than 6 times in the 12 months before applying, and 4 percent had contributed fewer than 12 times along their career. Regarding earnings, 7 percent of applicants have average earnings greater than US$1,200 (CLP 600,000) in the 12 months before applying to the BTA. Finally, in very few cases (0.1 percent) the applicants were not in the age range established by the program. We limited the sample to the 137,657 individuals who met the eligibility criteria and were at least 18 years old in May 2006 and 65 or less in May 2011. Furthermore, as mentioned above, we restricted the sample to individuals sharing a common support (i.e., under the same range of propensity scores of being in the treatment group on the characteristics presented in Table 1), ending up with a sample of 99,955 individuals.[24] Out of these observations, 30 percent (29,917 workers) enrolled in a training course in 2011 (treatment group). The remaining 70 percent (70,038 workers) were awarded a voucher but did not enroll in a training course (control group).

Table 1 shows descriptive statistics for the whole population of applicants, as well as for those in the control and treatment groups. The applicants were mostly Chilean (99 percent). Male participation was larger than female participation (54 vs. 46 percent, respectively). On average, applicants were 34 years old. Applicants had, on average, 11.9 years of education, which corresponds to almost finishing secondary education.[25] The most demanded areas of interest were skilled white-collar jobs, such as Administration (23 percent) and Computer Science (15 percent). In contrast, courses related to primary activities were in less demand (e.g., Agriculture, Construction, and Mining).

Figure 1 shows the evolution of average (log) monthly earnings and employment for individuals in the treatment and control groups relative to the month of application. To explore whether there are pre-exiting differences in trends between the treatment and the control groups, Figure 1 presents the trends in monthly earnings and employment prior to the application to the BTA for a period up to 50 months. Figure 1 shows that both groups follow similar trends in employment and (log) monthly earnings before the application of the BTA (and small differences after it), which indicates that our results can be attributable to the impact of the BTA and not to pre-existing trends.

[23] When merging these datasets 7,636 applicants of BTA were not found in the UI database. This may be due to the fact that the UI only captures labor histories of individuals with new contracts starting in October 2002. Thus, individuals whose contracts started before October 2002 are not in the UI.

[24] Figure 2A in the Appendix shows the distribution of predicted probabilities for treatment and control groups. Table 1A in the Appendix shows the results of the estimation of equation (1).

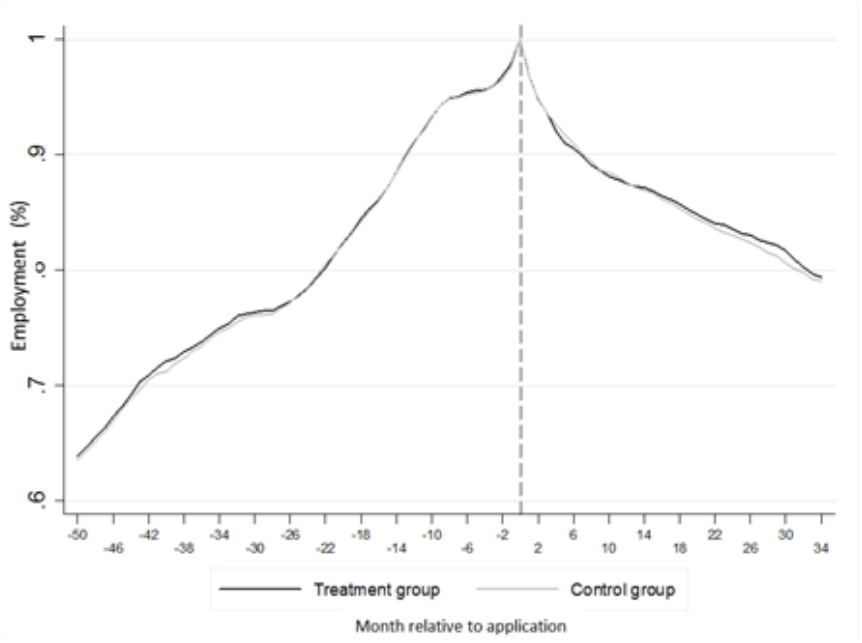
[25] The 2003 constitutional reform in Chile established that primary (8 grades) and secondary (4 grades) education is mandatory for all the inhabitants in Chile up to 18 years old. Before 2003, compulsory education only covered 8 years of primary education, and before 1965 and 1929, the minimum mandatory education was 6 and 4 years, respectively.

Table 1: Descriptive Statistics

	Control	Treatment	All	Difference	
N	70,038	29,917	99,955		
Male	0.54	0.55	0.54	-0.02	***
Age when individual applied	34.36	33.69	34.16	0.66	***
Immigrant	0.01	0.01	0.01	-0.01	***
Years of education	11.92	11.93	11.92	-0.01	
Change sector expectancy	0.43	0.45	0.44	-0.03	***
Area of interest					
Administration	26.06	17.13	23.38	8.93	***
Farming	2.36	1.66	2.15	0.70	***
Trade and services	7.62	7.52	7.59	0.10	
Computer Science	13.85	16.48	14.64	-2.63	***
Construction	5.56	6.41	5.81	-0.85	***
Mechanics	4.29	9.06	5.71	-4.77	***
Mining	5.98	1.54	4.65	4.44	***
Prevention	6.62	10.28	7.71	-3.66	***
Services	9.64	3.89	7.92	5.75	***
Transport	9.42	8.6	9.18	0.82	***
Tourism and languages	8.6	17.44	11.25	-8.84	***
Occupation					
Operator	13.53	14.41	13.8	-0.88	***
Craftsman	0.15	0.14	0.15	0.01	
Driver	4.58	4.38	4.52	0.20	
Office worker	20.69	20.14	20.53	0.55	**
Manager and supervisors	2.79	2.37	2.67	0.42	***
Construction workers	4.53	5.46	4.81	-0.93	***
Teachers	3.89	3.7	3.83	0.19	
Professionals	13.92	12.51	13.5	1.41	***
Service workers	3	3.34	3.1	-0.34	***
Sellers	10.45	10.13	10.35	0.32	
Other	22.47	23.43	22.75	-0.96	***
Country Zone					
Center	18.44	24.92	20.38	-6.48	***
Metropolitan	48.91	32.32	43.95	16.59	***
North	15.39	11.61	14.26	3.78	***
South	17.25	31.16	21.41	-13.91	***
Month in which individual applied					
11-may	11.59	14.16	12.36	-2.57	***
11-jun	11.82	12.39	11.99	-0.57	**
11-jul	8.9	9.89	9.2	-0.99	***
11-ago	14.11	13.46	13.92	0.65	***
11-sep	17.9	16.65	17.53	1.25	***
11-oct	13.68	12.87	13.44	0.81	***
11-nov	11.42	9.72	10.91	1.70	***
11-dic	10.57	10.85	10.66	-0.28	
Days between requesting the BTA and awarding it	23.01	24.96	23.59	-1.95	***
Wage when individual applied (pesos)	346,95	340,35	344,97	6,59	***
Employed (%)	100	100	100	0	
Contribution (months) year prior application	11.46	11.47	11.46	-0.01	
Contribution (month) (Since January 2006 to application)	51.0	51.05	51.01	-0.05	

NOTES: ***p<0.01, **p<0.05, *p<0.1. Source: Administrative data from SENCE and the Unemployment Insurance System.

Figure 1: Trends in Employment and (log) Monthly Earnings



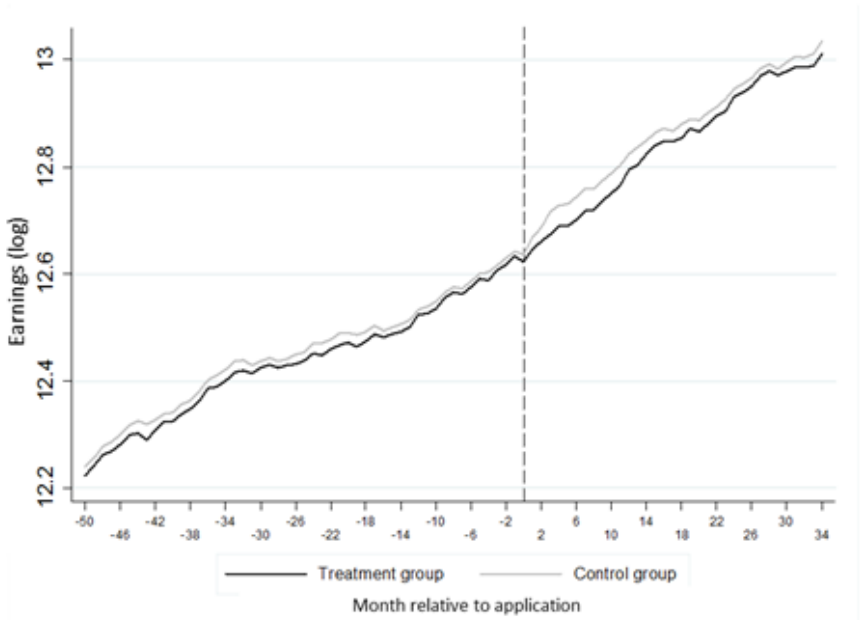


Table 2: Impact of the BTA on Employment and (log) Monthly Earnings, All Workers

Variables	(1) Employment	(2) Earnings
BTA	-0.006***	-0.122***
	(0.000)	(0.009)
Age	0.076	1.473
	(1.599)	(28.209)
Age2 (/100)	-0.020***	-0.425***
	(0.000)	(0.005)
Constant	-1.505	-41.166
	(45.619)	(804.916)
Individual FE	Yes	Yes
Time FE	Yes	Yes
Observations	10,195,410	10,195,410
R-squared	0.124	0.142
Number of individuals	99,955	99,955

NOTES: Earnings correspond to the log of nominal monthly earnings in US$. Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.

6 Results

This section reports the estimated impacts of the BTA on the probability of being employed, monthly earnings, employment duration, and probability of changing economic sector. It also explores whether the BTA has heterogeneous impacts by gender, level of education, and for those who had expectations of changing economic sector at the time of application. At the end of this section, we present two sets of robustness checks: (i) a placebo test testing for pre-treatment differential trends; and, (ii) an IV estimation accounting for the potential selection into treatment based on unobservable characteristics.

Table 2 presents the FE estimation of equation (2) of the overall impact of the BTA on the probability of being employed and individual's (log) monthly earnings.[26] As mentioned above, our primary interest lies in the estimation of the coefficient β, which represents the impact of the BTA in equation (2). Table 2 shows that the impacts of the BTA on employment and monthly earnings are negative and small in magnitude, particularly for the first variable. Overall, two and a half years after having applied to the BTA, enrolling in a training course using the voucher reduces the probability of being employed by 0.6 percentage points and reduces monthly earnings by 12 percent. These results are con sistent with those of Doerr et al. (2014), who only find positive impacts in employment after four years, and no positive effects on earnings during the same period.

Table 3 presents the heterogeneous impacts of the BTA voucher by gender and education. We define lower education (LE) as a dummy variable taking the value of 1 when the individual has not completed secondary education and 0 when the individual has completed secondary education or more. We find evidence that the BTA has differential effects by gender and level of education (as shown by the interaction terms in models 1 and 2 for employment and 7

[26] We also estimated RE model for equations in Tables 2, 3 and 4 and rejected the Hausman Test's null hypothesis in all cases. Results are available upon request.

and 8 for earnings). In particular, the BTA has a larger (and positive) effect on female compared to male employment and earnings, and it has a more negative effect on lower educated than on higher educated individuals.

In addition to being statistically different from the effect for males (as shown by the interaction terms in models 1 and 7 in Table 3), the effect of the BTA on both females employment and earnings is positive and statistically significant. The BTA increases the probability of women of being employed by 2 percentage points, and increases their earnings by 24 percent.[27] Interestingly, we find that the positive effect of the BTA on female labor outcomes is more concentrated among those with lower education (as shown by the interaction terms in models 3 and 9 in Table 3). Moreover, the BTA increases the probability of lower educated women of being employed by 1 percentage point, and increases their earnings by 9 percent.[28] For males, it is interesting to highlight that the BTA has a differential effect on those with lower and higher education but, in this case, it affects the lower educated more. Finally, among the samples of lower educated and higher educated individuals, the impact of the BTA on employment and earnings is larger (and in fact positive) for females than for males (as shown by the interaction terms in models 5 and 6 for employment and 11 and 12 for earnings). Once again, the effects seem to be larger for lower educated females.

To further explore the heterogeneous impacts of the BTA, Table 4 presents whether the effects vary among individual who had expectations of changing economic sector at the time of application to the program and those who did not. In general, using the complete sample as well as the subsamples of lower and higher educated females and males, the BTA has a differential effect according to the individuals' expectations of changing economic sector. Those who did not expect to change economic sector show a positive and significant effect of the BTA on both employment and earnings (coefficient on BTA in Table 4). In contrast, the BTA seems to negatively affect the employment probability and earnings of individuals expecting to change economic sector (sum of coefficients on BTA+ BTA*Expect changing sector in Table 4). The positive effects for those who did expect to change sectors seem to be larger among lower educated individuals (females and males) than among higher educated ones, and among females (lower and higher educated) compared to males. The negative effects of the BTA are also larger in magnitude on earnings than on employment probability.

In summary, we find evidence that the BTA negatively affects both individuals' employment probability and earnings. Even though, at a first glance, these results seem to be counterintuitive for a voucher program for labor training, they are likely to be linked to a long-term lock-in period that has been found in other studies (e.g., Doerr et al., 2014) and to certain individual characteristics. We find that the BTA's negative effects are more pronounced for individuals (females and males) who expected to change economic sector at the time of application. Finally, from a policy point of view, the BTA positively affects females' employment probability and earnings, particularly among those with

[27] These effects correspond to the sum of coefficients BTA+(BTA*Female) in models 1 and 7, which are both significant at the 99 percent level.

[28] These effects correspond to the sum of coefficients BTA+(BTA*Female) in models 3 and 9, significant at the 99 percent and 90 percent level, respectively.

Table 3: Impact of the BTA on Employment and (log) Monthly Earnings (by gender and education level)

	Dependent variable:Employment					
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	All	All	Female	Male	LE	HE
BTA	-0.024***	-0.006***	-0.003***	-0.008***	-0.012***	-0.025***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
BTA*Female	0.039***	-	-	-	0.059***	0.038***
	(0.001)	-	-	-	(0.003)	(0.001)
BTA*LE	-	-0.004***	0.014***	-0.007***	-	-
	-	(0.002)	(0.003)	(0.002)	-	-
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,195,410	10,195,410	4,659,666	5,535,744	800,496	9,394,914
R-squared	0.124	0.124	0.161	0.096	0.105	0.126
N	99,955	99,955	45,683	54,272	7,848	92,107
	Dependent variable: Earnings					
	(7)	(8)	(9)	(10)	(11)	(12)
Variables	All	All	Female	Male	LE	HE
BTA	-0.411***	-0.112***	-0.062***	-0.150***	-0.201***	-0.425***
	(0.011)	(0.009)	(0.014)	(0.012)	(0.038)	(0.012)
BTA*Female	0.646***	-	-	-	0.952***	0.620***
	(0.015)	-	-	-	(0.059)	(0.016)
BTA*LE	-	-0.147***	0.148***	-0.181***	-	-
	-	(0.028)	(0.050)	(0.035)	-	-
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,195,410	10,195,410	4,659,666	5,535,744	800,496	9,394,914
R-squared	0.142	0.142	0.178	0.113	0.119	0.144
N	99,955	99,955	45,683	54,272	7,848	92,107

NOTES: Earnings correspond to the log of nominal monthly earnings in US$. LE = Lower Education takes the value of 1 when the individual has not completed secondary education and 0 otherwise. HE = Higher Education takes the value of 1 when the individual has at least completed secondary education and 0 otherwise. All models also control for age and age squared. Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Table 2.A in the Appendix shows the completed regression.

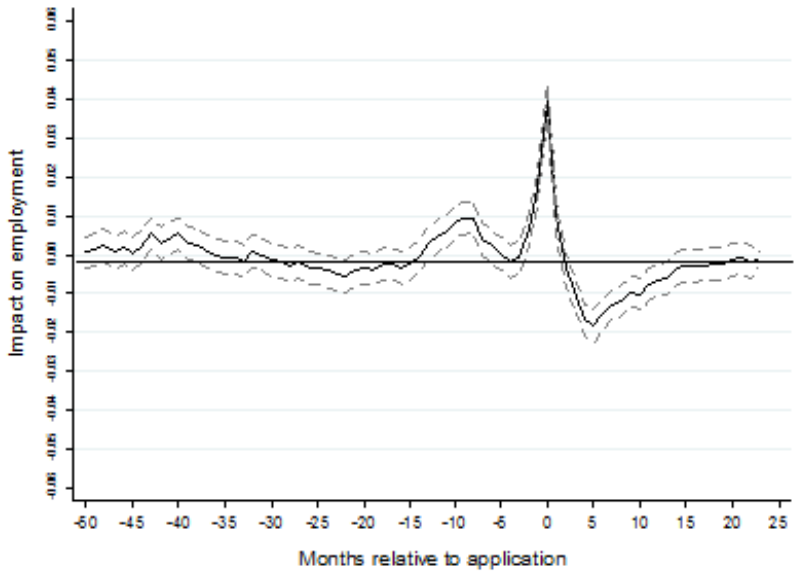
lower education.

6.1 Robustness Check

This section explores whether the assumption of common trends between individuals in the treatment and control groups is plausible, and then tests whether there is selection into treatment in terms of individual unobservable characteristics. Figure 2 plots the estimated "lags" and "leads" coefficients β corresponding to the effects of the BTA on employment probability and earnings from equation (3). As mentioned above, to hold the common trend assumption, we should observe that the estimated βs are close to 0. This would suggest that the BTA did not affect either employment or earnings before the time of application (month 0). Figure 2 shows that, particularly for earnings, the effect of BTA on pre-treatment outcomes is close to 0, which would support the use of a difference-in-difference model. Furthermore, Figure 2 shows evidence of a lock-in period in both employment and earnings. The negative effect of the BTA on earnings, but particularly on employment probability, approaches zero only after 22 months (i.e., corresponding to June 2014, the last time we observed the individuals).

The second set of results corresponds to the estimation of an IV model,

Figure 2: "Lags" and "Leads" Impacts of the BTA on Employment and (log) Monthly Earnings



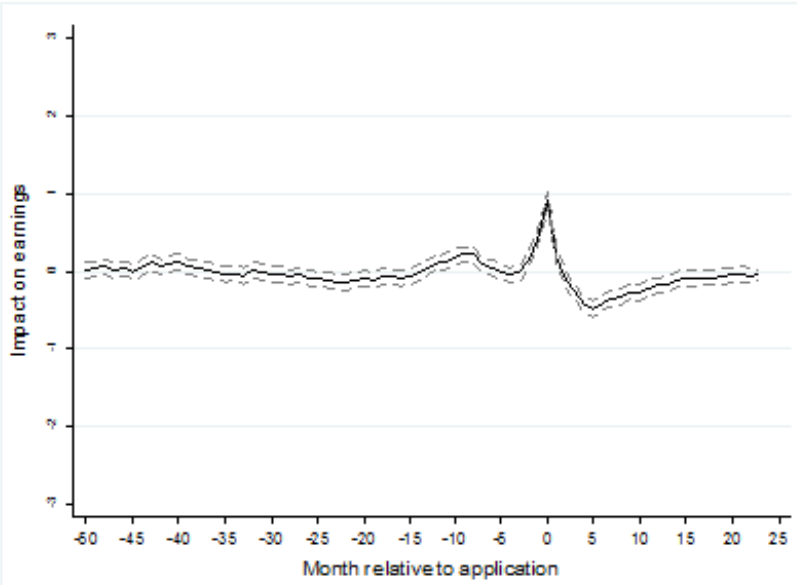


Table 4: Impact of the BTA on Employment and (log) Monthly Earnings (by expectation of changing economic sector when applying to the BTA)

	Dependent variable: Employment				
	(1)	(2)	(3)	(4)	(5)
Variables	All	Female LE	Male LE	Female HE	Male HE
BTA	0.008***	0.050***	0.022***	0.012***	0.001
	(0.001)	(0.004)	(0.003)	(0.001)	(0.001)
BTA*(expect changing sector)	-0.031***	-0.074***	-0.036***	-0.037***	-0.021***
	(0.001)	(0.006)	(0.004)	(0.001)	(0.001)
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,595,242	258,876	486,030	4,131,918	4,718,418
R-squared	0.124	0.167	0.077	0.16	0.098
Number of individuals	94,071	2,538	4,765	40,509	46,259
	Dependent variable: Earnings				
	(6)	(7)	(8)	(9)	(10)
Variables	All	Female LE	Male LE	Female HE	Male HE
BTA	0.147***	0.847***	0.379***	0.229***	0.017
	(0.012)	(0.075)	(0.052)	(0.018)	(0.016)
BTA*(expect changing sector)	-0.585***	-1.281***	-0.675***	-0.690***	-0.424***
	(0.015)	(0.101)	(0.070)	(0.024)	(0.021)
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,595,242	258,876	486,030	4,131,918	4,718,418
R-squared	0.142	0.181	0.09	0.178	0.116
Number of individuals	94,071	2,538	4,765	40,509	46,259

NOTES: Earnings correspond to the log of nominal monthly earnings in US$. LE = Lower Education takes the value of 1 when the individual has not completed secondary education and 0 otherwise. HE = Higher Education takes the value of 1 when the individual has at least completed secondary education and 0 otherwise. All models also control for age and age squared. Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1. Table 3.A in the Appendix shows the completed regression.

where initiating training is instrumented by the time between the application and the award of the voucher. As mentioned above, given that this IV variable is time-invariant, we are only able to estimate the impact of the BTA using cross-sectional data. However, the use of cross-sectional data allows us to estimate the effect of the BTA on two additional labor outcomes: employment duration and changes in economic sector. The first variable corresponds to the number of months worked since the individual's application to the BTA and the second is an indicator for whether the individual changed economic sector after applying to the BTA. Table 5 shows the 2SLS IV estimation corresponding to June 2014. Table 4A in the Appendix shows the IV estimations from December 2012 until June 2014.

The first column in Table 5 shows the first stage estimation of starting a training using the BTA as a function of the time lapse between application and award, and the other covariates includes in the second stage. The Durbin-Wu-Hausman test at the bottom of Table 5 leads to rejection of the null hypothesis that using the BTA is exogenous. In addition, the F-test (16.8) at the bottom of Table 5 is considerably larger than the rule of thumb of 10, which confirms the relevance of our instrument. The next two columns show that the IV estimation of the BTA on employment and earnings is negative but statistically insignificant. In contrast, the effect of the BTA on employment duration and the probability of changing economic sector after applying to the BTA are positive and significant. These two last results would suggest that the BTA is not only increasing the chances of employability of workers, but also helping them

Table 5: IV Estimates of the Impact of the BTA

	1st Stage	2nd Stage (June 2014)			
		Employment	Earnings	Months worked since BTA	Change sector after BTA
BTA	-	-0.335	-3.405	222.187***	1.790***
	-	(0.225)	(3.907)	(54.364)	(0.487)
Age	0.012***	0.019***	0.331***	-2.316***	-0.039***
	(0.002)	(0.003)	(0.054)	(0.748)	(0.007)
Age2 (/100)	-0.013***	-0.022***	-0.394***	2.512***	0.037***
	(0.002)	(0.004)	(0.061)	(0.852)	(0.008)
Male	0.032***	0.057***	1.056***	-5.953***	-0.008
	(0.004)	(0.008)	(0.137)	(1.904)	(0.017)
Years of education	-0.004***	0.001	0.052**	1.004***	0.002
	(0.001)	(0.001)	(0.020)	(0.284)	(0.003)
Inmigrant	0.108***	-0.009	-0.469	-24.981***	-0.202***
	(0.016)	(0.028)	(0.494)	(6.878)	(0.062)
Metropolitan	-0.174***	-0.032	0.01	38.953***	0.351***
	(0.005)	(0.040)	(0.687)	(9.565)	(0.086)
North	-0.125***	-0.062**	-0.648	27.291***	0.297***
	(0.006)	(0.028)	(0.493)	(6.863)	(0.061)
South	-0.073***	-0.023	-0.216	16.259***	0.122***
	(0.005)	(0.017)	(0.295)	(4.103)	(0.037)
IV: Months between application and access	0.009***	-	-	-	-
	(0.002)	-	-	-	-
Constant	0.285***	0.520***	-3.599***	-43.277**	0.646***
	(0.037)	(0.075)	(1.304)	(18.148)	(0.163)
F-test	16.783	-	-	-	-
Durbin-Wu-Hausman test (p-value)	0.000	-	-	-	-
Observations	74,250	74,250	74,250	74,250	74,250

NOTES: Earnings correspond to the log of nominal monthly earnings in US$. Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.

to change sectors, which might be associated to the lower earnings.

7 Concluding Remarks and Discussion

By increasing workers' choices, vouchers can create healthy competition between training providers. This competition might help to reduce inefficiencies in the delivery of training and improve labor market outcomes. However, publicly funded vouchers might not lead to these improvements and/or to the maximization of social well-being in cases when individuals are poorly informed or when the training level does not maximize well-being of the society as a whole. Unfortunately, the existing empirical evidence on the effect of training vouchers is not conclusive regarding whether such a policy is more efficient than alternative policies (e.g., programs where assignments to training are made by the government or its agents). In addition to contributing to the scarce empirical evidence on the effects of training vouchers, particularly in developing countries, this paper is motivated by the fact that the BTA has the second largest budget among the public training services offered in Chile.

Overall, our results indicate that, at least during the first two and a half years after applying to the BTA, the program negatively affect individuals' employment probability and earnings. In contrast, the BTA positively affects the labor outcomes of females, particularly of those with lower education. This result suggests that training programs might help to improve the low rate of

female labor participation and the gender wage gap in Chile. The counterintuitive negative effects found for the BTA are likely to be linked to a long-term lock-in period that has been found in other studies (e.g., Doerr et al., 2014) and to certain individual characteristics. In particular, we find that the BTA exhibits more negative effects for individuals (females and males) who expect to change economic sector at the time of application to the BTA. Further results show that the BTA increases the employment duration and the probability of changing economic sector. This last result might be associated with a decrease in earnings after changing to a new economic sector.

The negative effects on employment and earnings are similar to previous findings in the literature that individuals who took training courses through vouchers have worse labor outcomes than those who did not (Corson et al., 1993; Dickinson and West, 1983; McConnell et al., 2006). It is important to highlight, however, that our results correspond to short- and medium-term estimates. In addition, they correspond to employment and earnings occurring only in the formal sector, which are the ones observed in administrative data. Nevertheless, based on the findings of Doerr et al. (2014), we would not expect the longer-run coefficients to show positive and large effects on employment or earnings. The authors observed participants for four years after the beneficiaries received the voucher, and found no significant effect in this time period.

According to Doerr et al. (2014), the negative effect of the voucher could be the result of a lock-in period for participation in the program (i.e., individuals reduce the intensity of job searching or accepting job offers). Another explanation suggested by our results, however, is that the negative results in earnings are associated with individuals changing between economic sectors and that this sector mobility implies a cost, possible due to the loss of sector-specific human capital.

From a public policy perspective, it is important to evaluate why the BTA did not have the expected impact on workers' outcomes in Chile and how it could be improved to become a cost-effective program that addresses both employability and productivity. Given that the program is not estimated to have, on average, a positive effect on earnings or employment, a cost-benefit analysis is not necessary at this point. However, the BTA—with a cost of US$32 million in 2011—is the second largest program in SENCE's budget.

We therefore argue that, before continuing with the program as it is currently designed, it is worthwhile to explore in more detail the factors that limit the program's effectiveness. In this process, it is necessary to distinguish between design and implementation failures of the BTA. Among the main implementation failures, the following are worth highlighting: limited training courses; lack of mechanisms to incentivize competition between OTECs; and lack of vocational feedback and transmission of information to help individuals make an informed decision about training.

Our main recommendations would be along the following lines: (i) provide information to individuals regarding costs and labor market returns of the training options, as well as the quality and placement rate of each OTEC; (ii) offer vocational support to individuals, particularly to those with larger economic disadvantage; (iii) verify the quality and relevance of the training being offered

by the OTECs; (iv) incentivize competition among OTECs for public resources, awarding contracts based on their previous results; (v) regulate the market of training providers to assure quality and relevance of the training courses offered; and (vi) test and evaluate any change to the current program before scaling it up.

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Appendix

Figure 1.A: Start and Finish date of Courses

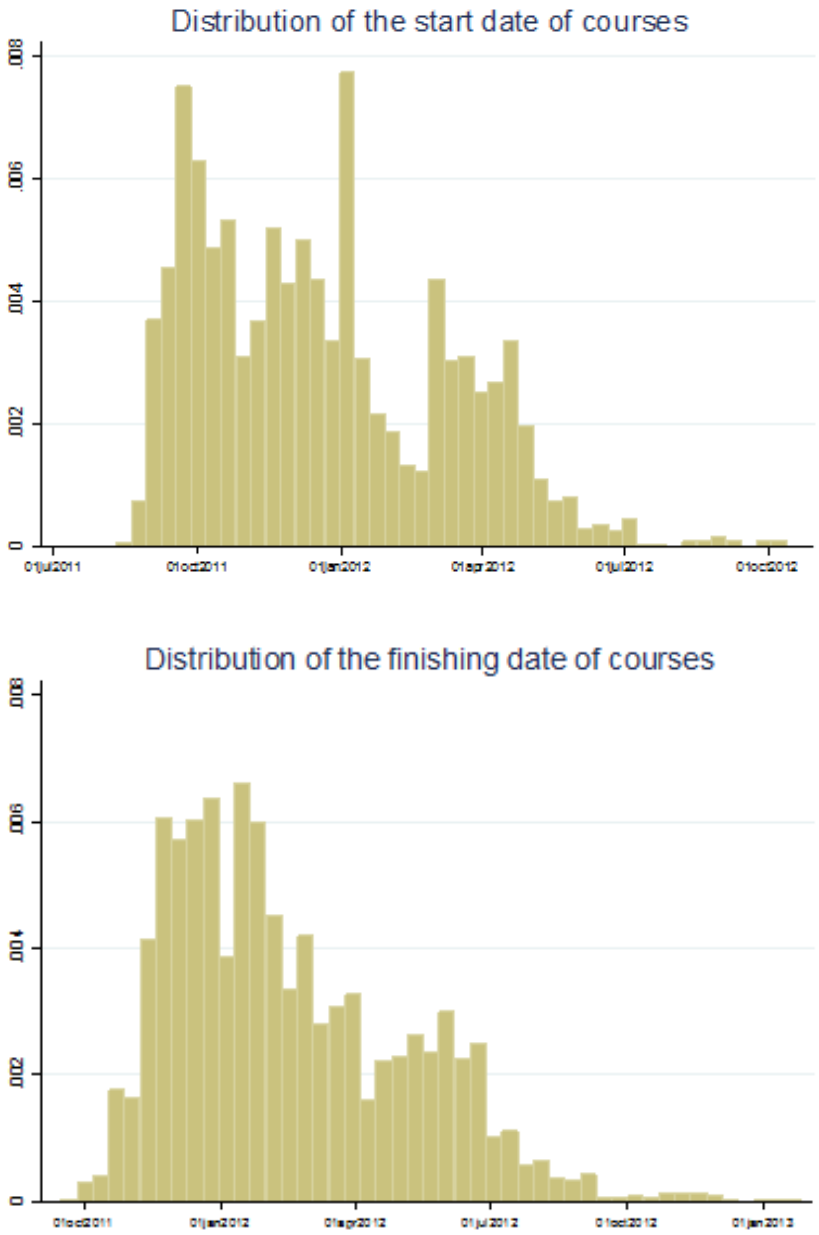

Figure 2.A: Probability of Using the BTA for Treatment and Control Groups

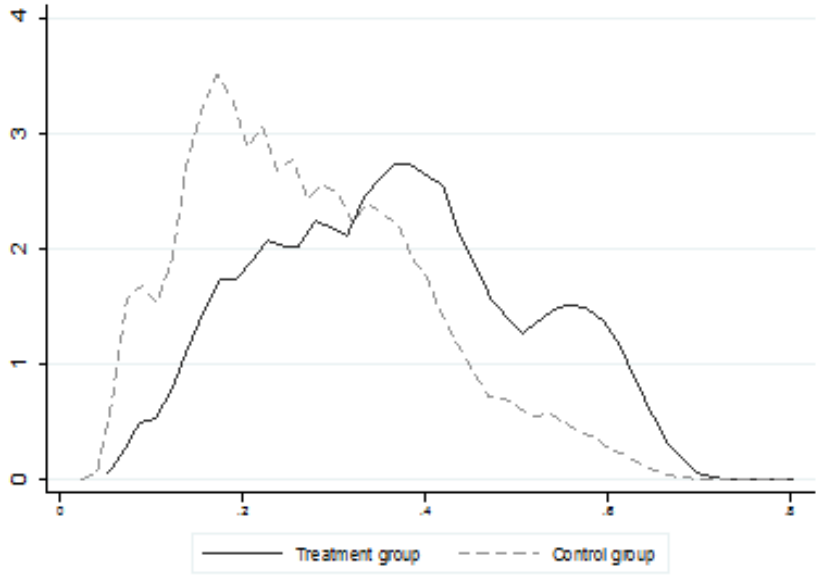

Table 1.A: Probability of Using the BTA (marginal effects)

	Variables	Coef.	sd.
	Sex	0.000	(0.020)
	Years of education	0.001	(0.004)
	Age	-0.030	(0.083)
	Age2	0.000	(0.001)
	Mean Wage (year before application)	0.000	(0.000)
	Migrant	0.528***	(0.172)
	Months worked year before application	-0.001	(0.006)
Month of application (base category: May)	June	-0.179***	(0.048)
	July	-0.189**	(0.087)
	August	-0.297***	(0.110)
	September	-0.358***	(0.100)
	October	-0.356***	(0.109)
	November	-0.379***	(0.123)
	December	-0.263**	(0.119)
Area of interest (base category: Administration)	Farming	-0.026	(0.173)
	Trade and services	0.236***	(0.042)
	Computer Science	0.363***	(0.041)
	Construction	0.264***	(0.097)
	Mechanics	0.642***	(0.221)
	Mining	-0.491**	(0.208)
	Prevention	0.491***	(0.066)
	Services	-0.288***	(0.050)
	Transport	0.142**	(0.071)
	Tourism and languages	0.670***	(0.085)
Occupations (base category: Operator)	Craftsman	-0.026	(0.096)
	Driver	-0.015	(0.051)
	Office worker	-0.046	(0.051)
	Manager and supervisors	-0.112**	(0.044)
	Construction workers	0.063	(0.106)
	Teachers	-0.115***	(0.037)
	Professionals	-0.159***	(0.050)
	Service workers	0.113	(0.089)
	Sellers	-0.109***	(0.041)
	Other	-0.020	(0.037)
Country Zone (base category: Center)	Metropolitan	-0.469**	(0.200)
	North	-0.404**	(0.204)
	South	0.094	(0.379)
	Days between applying to and awarding the BTA	-0.003**	(0.001)
Observations			99,979

NOTES: Robust standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table 2.A: Impact of the BTA on Employment and (log) Monthly Earnings, Full Model (by gender and education level)

	Dependent variable: Employment					
	(1)	(2)	(3)	(4)	(5)	(6)
Variables	All	All	Female	Male	LE	HE
BTA	-0.024***	-0.006***	-0.003***	-0.008***	-0.012***	-0.025***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)
BTA*Female	0.039***	-	-	-	0.059***	0.038***
	(0.0019	-	-	-	(0.003)	(0.001)
BTA*LE	-	-0.004***	0.014***	-0.007***	-	-
	-	(0.002)	(0.003)	(0.002)	-	-
Age	0.076	0.076	0.051***	0.042***	0.034***	0.08
	(1.599)	(1.599)	(0.000)	(0.000)	(0.001)	(1.864)
Age2 (/100)	-0.020***	-0.020***	-0.017***	-0.022***	-0.009***	-0.020***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)
Constant	-1.507	-1.505	-0.879***	-0.439***	-0.511***	-1.59
	(45.614)	(45.619)	(0.010)	(0.009)	(0.027)	(52.481)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,195,410	10,195,410	4,659,666	5,535,744	800,496	9,394,914
R-squared	0.124	0.124	0.161	0.096	0.105	0.126
N	99,955	99,955	45,683	54,272	7,848	92,107
	Dependent variable: Earnings					
	(7)	(8)	(9)	(10)	(11)	(12)
Variables	All	All	Female	Male	LE	HE
BTA	-0.411***	-0.112***	-0.062***	-0.150***	-0.201***	-0.425***
	(0.011)	(0.009)	(0.014)	(0.012)	(0.038)	(0.012)
BTA*Female	0.646***	-	-	-	0.952***	0.620***
	(0.015)	-	-	-	(0.059)	(0.016)
BTA*LE	-	-0.147***	0.148***	-0.181***	-	-
	-	(0.028)	(0.050)	(0.035)	-	-
Age	1.475	1.472	1.003***	0.868***	0.697***	1.547
	(28.207)	(28.209)	(0.007)	(0.006)	(0.016)	(32.908)
Age2 (/100)	-0.428***	-0.424***	-0.366***	-0.467***	-0.216***	-0.431***
	(0.005)	(0.005)	(0.007)	(0.006)	(0.015)	(0.005)
Constant	-41.201	-41.152	-29.658***	-22.331***	-23.137***	-42.753
	(804.842)	(804.915)	(0.177)	(0.157)	(0.479)	(926.698)
Individual FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	10,195,410	10,195,410	4,659,666	5,535,744	800,496	9,394,914
R-squared	0.142	0.142	0.178	0.113	0.119	0.144
N	99,955	99,955	45,683	54,272	7,848	92,107

NOTES: Earnings correspond to the log of nominal monthly earnings in US$. LE = Lower Education takes the value of 1 when the individual has not completed secondary education and 0 otherwise. HE = Higher Education takes the value of 1 when the individual has at least completed secondary education and 0 otherwise. All models also control for age and age squared. Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table 3.A: Impact of the BTA on Employment and (log) Monthly Earnings, Full Model (by expectation of changing economic sector when applying to the BTA)

	Dependent variable: Employment				
	(1)	(2)	(3)	(4)	(5)
Variables	All	Female LE	Male LE	Female HE	Male HE
BTA	0.008***	0.050***	0.022***	0.012***	0.001
	(0.001)	(0.004)	(0.003)	(0.001)	(0.001)
BTA*(expect changing sector)	-0.031***	-0.074***	-0.036***	-0.037***	-0.021***
	(0.001)	(0.006)	(0.004)	(0.001)	(0.001)
Age	0.078	0.056***	0.026***	0.052***	0.043***
	(1.788)	(0.002)	(0.001)	(0.000)	(0.000)
Age2 (/100)	-0.021***	-0.023***	-0.006***	-0.019***	-0.023***
	(0.000)	(0.002)	(0.001)	(0.000)	(0.000)
Constant	-1.551	-1.225***	-0.201***	-0.878***	-0.453***
	(50.985)	(0.051)	(0.034)	(0.011)	(0.009)
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,595,242	258,876	486,030	4,131,918	4,718,418
R-squared	0.124	0.167	0.077	0.16	0.098
Number of individuals	94,071	2,538	4,765	40,509	46,259
	Dependent variable: Earnings				
	(6)	(7)	(8)	(9)	(10)
Variables	All	Female LE	Male LE	Female HE	Male HE
BTA	0.147***	0.847***	0.379***	0.229***	0.017
	(0.012)	(0.0759	(0.052)	(0.018)	(0.016)
BTA*(expect changing sector)	-0.585***	-1.281***	-0.675***	-0.690***	-0.424***
	(0.015)	(0.101)	(0.070)	(0.024)	(0.021)
Age	1.511	1.055***	0.557***	1.025***	0.891***
	(31.542)	(0.030)	(0.020)	(0.007)	(0.007)
Age2 (/100)	-0.445***	-0.440***	-0.155***	-0.404***	-0.489***
	(0.005)	(0.027)	(0.018)	(0.008)	(0.007)
Constant	-42.06	-35.225***	-17.937***	-29.635***	-22.581***
	(899.651)	(0.877)	(0.601)	(0.186)	(0.168)
Individual FE	Yes	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes	Yes
Observations	9,595,242	258,876	486,030	4,131,918	4,718,418
R-squared	0.142	0.181	0.09	0.178	0.116
Number of individuals	94,071	2,538	4,765	40,509	46,259

NOTES: Earnings correspond to the log of nominal monthly earnings in US$. LE = Lower Education takes the value of 1 when the individual has not completed secondary education and 0 otherwise. HE = Higher Education takes the value of 1 when the individual has at least completed secondary education and 0 otherwise. All models also control for age and age squared. Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.

Table 4.A: IV Estimates of the Impact of the BTA

Variables	1st Stage	2nd Stage				
		Month	Employment	Earnings	Months worked since BTA	Change sector
BTA	-	12-dic	-0.343*	-5.535	226.600***	-0.066
	-		(0.189)	(4.361)	(55.352)	(0.109)
Age	0.012***	13-ene	-0.379*	-6.563	226.221***	-0.214*
	(0.002)		(0.197)	(4.540)	(55.262)	(0.122)
Age2 (/100)	-0.013***	13-feb	-0.193	-2.061	226.028***	-0.094
	(0.002)		(0.183)	(4.356)	(55.218)	(0.106)
Male	0.032***	13-mar	-0.063	1.155	225.966***	-0.141
	(0.004)		(0.177)	(4.326)	(55.206)	(0.117)
Years of education	-0.004***	13-abr	-0.212	-2.765	225.754***	-0.331**
	(0.001)		(0.186)	(4.412)	(55.157)	(0.143)
Inmigrant	0.108***	13-may	-0.086	0.649	225.668***	-0.051
	(0.016)		(0.184)	(4.465)	(55.140)	(0.111)
Metropolitan	-0.174***	13-jun	-0.163	-1.196	225.505***	-0.301**
	(0.005)		(0.189)	(4.525)	(55.105)	(0.130)
North	-0.125***	13-jul	-0.071	0.895	225.434***	-0.011
	(0.006)		(0.187)	(4.553)	(55.091)	(0.104)
South	-0.073***	13-ago	-0.168	-1.665	225.265***	-0.048
	(0.005)		(0.192)	(4.602)	(55.055)	(0.103)
IV: Months between application and access	0.009***	13-sep	-0.278	-4.152	224.987***	-0.027
	(0.002)		(0.202)	(4.779)	(54.993)	(0.097)
Constant	0.285***	13-oct	-0.327	-5.285	224.659***	-0.262**
	(0.037)		(0.205)	(4.794)	(54.918)	(0.125)
		13-nov	-0.069	0.838	224.591***	0.071
			(0.190)	(4.639)	(54.906)	(0.103)
		13-dic	-0.148	-1.262	224.443***	0.016
			(0.194)	(4.704)	(54.876)	(0.100)
		14-ene	-0.211	-2.786	224.231***	-0.273**
			(0.201)	(4.816)	(54.829)	(0.129)
		14-feb	-0.353	-6.51	223.878***	-0.138
			(0.215)	(5.082)	(54.749)	(0.108)
		14-mar	-0.545**	-10.864**	223.333***	-0.240*
			(0.238)	(5.506)	(54.622)	(0.126)
		14-abr	-0.461**	-8.935*	222.872***	-0.042
			(0.229)	(5.360)	(54.516)	(0.111)
		14-may	-0.35	-6.076	222.522***	-0.185
			(0.221)	(5.220)	(54.438)	(0.115)
		14-jun	-0.334	-5.518	222.187***	0.115
			(0.225)	(5.312)	(54.364)	(0.135)
F-test	16.783		-	-	-	-
Durbin-Wu-Hausman test (p-value)	0.000		-	-	-	-
Observations	74,250		74,250	74,250	74,250	74,250

NOTES: Earnings correspond to the log of nominal monthly earnings in US$. Standard errors in parentheses. ***p<0.01, **p<0.05, *p<0.1.