

Carpio, Susana; Giuliodori, David; Rucci, Graciana; Stucchi, Rodolfo

Working Paper

The effect of temporary contracts on human capital accumulation in Chile

IDB Working Paper Series, No. IDB-WP-253

Provided in Cooperation with:

Inter-American Development Bank (IDB), Washington, DC

Suggested Citation: Carpio, Susana; Giuliodori, David; Rucci, Graciana; Stucchi, Rodolfo (2011) : The effect of temporary contracts on human capital accumulation in Chile, IDB Working Paper Series, No. IDB-WP-253, Inter-American Development Bank (IDB), Washington, DC, <https://hdl.handle.net/11319/3030>

This Version is available at:

<https://hdl.handle.net/10419/115396>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

The effect of temporary contracts on human capital accumulation in Chile

Susana Carpio
David Giuliodori
Graciana Rucci
Rodolfo Stucchi

March 2011

The effect of temporary contracts on human capital accumulation in Chile

Susana Carpio
David Giuliadori
Graciana Rucci
Rodolfo Stucchi



Inter-American Development Bank

2011

Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

The effect of temporary contracts on human capital accumulation in Chile / Susana Carpio ... [et al.].
p. cm. (IDB working paper series ; 253)

Includes bibliographical references.

1. Employer-supported education—Chile. 2. Employees—Training of—Chile. 3. Temporary employees—Chile. 4. Human capital—Chile. I. Carpio, Susana. II. Gioliodori, David. III. Rucci, Graciana. IV. Stucchi, Rodolfo. V. Inter-American Development Bank. VI. Series.

<http://www.iadb.org>

Documents published in the IDB working paper series are of the highest academic and editorial quality. All have been peer reviewed by recognized experts in their field and professionally edited. The information and opinions presented in these publications are entirely those of the author(s), and no endorsement by the Inter-American Development Bank, its Board of Executive Directors, or the countries they represent is expressed or implied.

This paper may be freely reproduced.

The effect of temporary contracts on human capital accumulation in Chile^{*}

Susana Carpio,[†] David Giuliadori,[‡] Graciana Rucci,[§] Rodolfo Stucchi^{**}

March 18, 2011

Abstract

This paper studies the probability of receiving employer-paid training and training independently of who finance it for permanent and temporary workers in Chile. We use data from the Social Protection Survey, EPS, which allow us to construct a panel of workers with information from 2002, 2004, 2006, and 2009. Our results suggest that having a temporary contract in Chile reduces the probability of receiving employer-paid training. We also find that this deficit is not compensated by other types of training. This finding is important for two reasons. First, the proportion of temporary workers that obtain an open-ended contract is low. Second, the productivity growth in Chile after 1997 is practically zero and human capital accumulation is one of the factors that might help to recover the path of productivity growth.

Keywords: Temporary work, Training, Human Capital Accumulation, Latin America, Chile

JEL Classification: J08, J24, J41

^{*} The views expressed in this document are those of the authors and do not represent those of the Inter-American Development Bank. The authors are thankful for useful comments and suggestions received from David Kaplan, Yyannu Cruz Aguayo and Carmen Pagés. The usual disclaimer applies.

[†] Inter-American Development Bank, Washington DC, USA. Email: scarpio@iadb.org

[‡] Instituto de Economía y Finanzas (Universidad Nacional de Córdoba, Córdoba, Argentina) and ECONFOCUS, Córdoba, Argentina. Email: dgiuliod@econfocus.com.ar

[§] Inter-American Development Bank, Washington DC, USA. Email: gracianar@iadb.org

^{**} Inter-American Development Bank, Washington DC, USA.

1. Introduction

In just fifteen years, from 1990 to 2005, Chile doubled its GDP per capita. However, after 1997 the rate of productivity growth decelerated—and it has been close zero after that year—casting doubts about the feasibility of doubling GDP per capita again from 2005-2020. It has been argued that a necessary condition to arrive 2020 with a GDP per capital that is twice the 2005 level, it is necessary to return to pre-1997 productivity growth rates. Recovering those rates will require important efforts in terms of human capital accumulation, innovation, and product diversification.

Human capital accumulation is one of the main determinants of economic development. Training, which serves to close the gap between current and needed capabilities, may help Chile to return to its pre-1997 growth rates. If market (or government) failures lead to suboptimal levels of training, addressing these failures could improve firms' productivity and, consequently, national economic development.

From a theoretical point of view, the relationship between training and temporary contracts is not straightforward. On the one hand, some firms hire temporary workers because of the high firing cost associated with permanent workers. Turnover rates for temporary workers are considerable higher than for permanent workers, and firms might consider that providing training to temporary workers is unprofitable because of they will not stay in the firm long enough. On the other hand, temporary contracts can be used as a probationary period or as stepping stones for a permanent position (Autor, 2001; Booth et al., 2002; Portugal and Varejão, 2009; and Cueto and Malo, 2009). In this case, it is not clear that firm's incentive is to provide training to these workers. Firms might offer training to temporary workers only after deciding they want to retain those workers. However, if they are interested in testing workers learning capabilities, it is also possible that they offer training to temporary workers.

Employment Protection Legislation (EPL) plays an important role in the way firms use temporary contracts. If the duality in the regulation of fixed-term and open-ended contracts is large, firms are reluctant to offer open-ended contracts and it is possible to expect an increase of the proportion of temporary contracts and a high turnover rate for these workers. As mentioned above, firms' incentives to invest in job training in this context can be considerably lower (Almeida and Aterido, 2008; Bassanini et al., 2005).

In practice, the empirical evidence shows that temporary workers have lower probability of receiving training. Arulampalam and Booth (1998) present evidence for UK, Albert et al (2005) for Spain, Wallete (2005) for Sweden, and Sauermann (2006) for Germany. Arulampalam et al (2004) also present evidence for European countries; they consider several countries and use a homogeneous methodology. To the best of our knowledge there is no evidence for countries in Latin America.

According to The World Bank's Doing Business 2010, regulations of employment in Chile do not seem to be more rigid than those in OECD countries. However, once the general rigidity index is separated into its components, some important differences emerge. In terms of firing costs, Chilean firms have to pay twice as much as firms in OECD countries—a firm in Chile needs to pay 52 weeks of salary while a firm in the average OECD country only 26 weeks.

Similarly, the difficulty hiring index is higher in Chile than in OECD countries. The OECD countries that are closer to Chile in terms of difficulty hiring are Mexico, Poland, Portugal, and Spain.

These differences in EPL can explain, to some extent, why the percentage of permanent workers in the period 2004-2007 in Chile was lower than in OECD countries—83 percent and 88 percent, respectively—and why the turnover rate in Chile is considerably higher than in OECD countries—average tenure in OECD countries is ten years while average tenure in Chile is only four. Consistent with the hypothesis that temporary contracts can affect training the workers receive, Chile lags behind OECD countries in terms of training—in 2006, 33 percent of workers received training in OECD countries and only 23 percent in Chile.

Providing direct evidence from Chile is important not only because Chile is different from the average OECD country but also because there is no evidence from other Latin American country. The Chilean government has been immersed in discussions about changes in labor regulations and the efficiency of certain instruments to promote investment in workforce training, improve employability and boost productivity. The lack of evidence about these issues has been an important barrier to reach agreements. This paper aims to shed light on some of these issues. In particular, we concentrate on answering two questions: (i) Do temporary workers receive less employer-paid training? (ii) Do temporary workers compensate the lower training received at their job with other type of training? We are also interested in providing evidence about the transition from temporary to permanent work.

We use data from four waves of the *Social Protection Survey* (EPS, Encuesta de Protección Social) covering the period 2002-2009. These surveys allow us to construct a panel of 6,274 workers and 11,864 observations. These surveys contain information about the main two variables of interest, i.e., the type of contract workers have and the training they receive. They also have rich information about workers' education, family composition, and characteristics of the firms in which they are employed.

The information we have allows us to estimate the probability of receiving training conditional on the type of contract and a set of controls. We check the robustness of the results to several specifications of that probability. We first estimate a simple probit model. Given that some of the variables in which we are interested, namely, education and the type of contract can be endogenous, we estimate a linear probability model controlling for the endogeneity of these variables. After testing and rejecting the endogeneity of the type of contract, we estimate a probit model in which only education is endogenous. Finally, we check the robustness of our results controlling for unobserved heterogeneity assuming random effects.

We find that having a temporary contract reduces the probability of receiving employer-paid training in about 0.035. This is quantitatively important. The unconditional probability that a temporary worker receive employer-paid training is 0.07; therefore, 0.035 represents an increase in the probability of receiving employer-paid training of 50 percent. We also find that temporary workers have a lower probability of receiving training when we consider training independently of its financing—i.e. when we consider training financed by families, government, unions, and employers. Therefore, the deficit in employer-paid training for temporary workers is not compensated by other types of training. These results were robust for all the estimation

procedures we applied. We also find that the conversion from temporary to permanent workers is low and shows a decreasing trend.

The rest of the paper is organized as follows. Section 2 briefly reviews the literature about temporary work and training. Section 3 presents evidence about temporary work and training in Chile. Section 4 describes the dataset and presents the main descriptive statistics of the sample. Section 5 discusses the empirical strategy. Section 6 presents the empirical results. Section 7 discusses some extensions. Finally, section 8 concludes.

2. Temporary work and training in the literature

There are several studies analyzing the relationship between training and temporary workers. Most of them explored the effect of having a temporary contract on the probability of receiving training in European countries. In general, they find that temporary workers receive less training than workers with open-ended contracts. Table 1 presents a brief description of these studies.

[Table 1 here]

Arulampalam and Booth (1998) explore the relation between work-related training and labor market flexibility—which they proxy by contract type, part-time employment, and lack of union coverage—in the UK. Using the first five waves of the British Household Panel Survey conducted over the period 1991-1995 they find that workers on short-term employment contracts, who are working part-time, or who are not covered by a union collective agreement, are significantly less likely to be involved in any work-related training to improve or increase their skills.

Arulampalam et al (2004) establish some stylized facts about the extent and determinants of work-related training in ten⁶ European Union (EU) countries, and show how these are different for men and women. They use the first six waves of the European Community Household Panel (ECHP), which is a large-scale comparative survey collected annually since 1994. For the purpose of our study, their main result is a negative association between fixed-term contracts and training. However, they have other interesting findings related to the probability of receiving training. They point out that, in the countries they studied, women are no less likely than men to undertake training. Moreover, they find that women are more likely than men to undertake training in four countries. Although they do not find a significant age profile for training in the case of women, they do find a strong negative profile for men. In most countries training is positively associated with public sector employment, high educational attainment and a high position in the wage distribution.

Wallete (2005) investigates the relation between temporary jobs and on-the-job training in the Swedish labor market during the 1990s. This paper shows that the probability of receiving on-the-job training is lower for temporary workers than for permanent workers. However,

⁶ The countries they study are: Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Netherlands, Spain, and UK.

conditional on a worker receiving some on-the-job training, temporary workers do not receive less training than permanent workers.

Albert et al (2005) study the relationship between workers' type of contract and the probability of receiving firm-provided training in Spain. They find that workers with temporary contracts are less likely to be employed in firms that train and, if they are hired by those firms, they also have a lower probability of being chosen to participate in firm-provided training activities.

Bassanini et al (2005) show that the probability of receiving training for temporary workers is lower than the corresponding probability for permanent workers. Like Arulampalam et al (2004) they use the European Community Household Panel (ECHP) from 1995 to 2001. They estimate a probit model controlling for individual, job and firm characteristics. An interesting result from their work is that temporary workers are willing to pay for their own training and they pay for it more often than permanent workers. Sauermann (2006) also study the probability of receiving training in Germany, as well as considering who pays for the training. Using data from the German Socio-Economic Panel (GSOEP), he finds that temporary workers receive less employer-sponsored training and that their investments in employee-sponsored training do not compensate for the lower investments of the firm.

There are also several studies about the transition from temporary to permanent work. This issue seems relevant for understanding whether or not workers who do not receive training in one period continue without training in later periods. The evidence is mixed. Some studies find that temporary jobs are the path to permanent jobs. However, there are also studies that assert that temporary workers change from one temporary work to another temporary work without reaching permanent employment, with periods of unemployment separating their different temporary jobs.

Spain is the European country with the highest proportion of temporary workers and therefore there are several papers studying this interesting case. Amuedo-Dorantes (2000) uses the Spanish Labor Force Survey to assess whether temporary employment is non-transitional and involuntary. Analyzing the rates and dynamics of transitions into and out of temporary employment across different groups of working-age respondents, she finds that much of Spanish temporary employment is involuntary, with temporary workers having limited opportunities for advancement. Regarding the public effort for promoting the conversion of temporary into open-ended contracts, Amuedo-Dorantes (2001) finds that dismissal cost reductions for permanent workers promoted the hiring of permanent workers but had virtually no impact on contract conversions. Similarly, Güell and Petrongolo (2007) study the duration pattern of fixed-term contracts and the determinants of their conversion into permanent ones. They find that conversion rates are generally below 10%. The estimated conversion rates roughly increase with tenure, with a pronounced spike at the legal limit, when there is no legal way to retain the worker on a temporary contract. They argue that estimated differences in conversion rates across categories of workers can stem from differences in the outside options of workers and thus the power to credibly threaten to quit temporary jobs.

The transition from temporary work to permanent work was also analyzed in other European countries. Scherer (2004) studies whether the first job serves as a "stepping stone" or as a "trap" in West Germany, Great Britain and Italy. Her findings are not consistent with the stepping-stone hypothesis and provide some support for the entrapment hypothesis. Despite the greater mobility

chances of over-qualified workers, the initial disadvantage associated with status-inadequate jobs is not fully overcome during their future careers. However, the negative effects are due to the relatively lower entry level positions. These effects are mediated by the national labor market structure, with the more flexible British model providing the best chances of making up for initial disadvantages, and the more tightly regulated and segmented market in Germany and Italy leading to stronger entrapment in lower status positions. No negative effects of the type of contract are found for later occupational positions in any of the countries.

Using data from the British Household Panel Survey, Booth et al (2002) confirm the popular perception that temporary jobs are generally not desirable when compared to permanent employment. Temporary workers have lower levels of job satisfaction, receive less training and are less well-paid. However, they find some evidence that fixed-term contracts are a stepping stone to permanent work. Women who start in fixed-term employment and move to permanent jobs fully catch up to those who start in permanent jobs.

The path to a permanent job often implies a sequence of temporary contracts, sometimes including periods of unemployment. Gagliarducci (2005) accounts for these transitions applying multiple-spell duration techniques to an Italian dataset. He finds that the probability of moving from a temporary to a permanent job increases with the duration of the contract, but decreases with repeated temporary jobs and especially with interruptions. This suggests that it is not temporary employment per se but the intermittence associated with temporary employment that is detrimental to employment prospects.

Similarly, D'Addio and Rosholm (2005) study the transition from temporary contracts to open-ended contracts and unemployment using the waves 1994–1999 of the European Community Household Panel. Using a multinomial logit model they distinguish between exits into permanent employment and non-employment. Their findings suggest that in general for EU, very short contracts provide higher chances of labor market exclusion, especially for men. Similarly, de Graaf-Zijl et al (2006) study whether temporary work increases the transition rate to regular work. Using a longitudinal survey data of individuals to estimate a multi-state duration model, they find that temporary jobs shorten the unemployment duration. However, they find that temporary jobs do not increase the fraction of unemployed workers having regular work within a few years after entry into unemployment.

Although there is not empirical evidence focused on Chile, the evidence for other countries suggests it that temporary work might play a role in the low levels of training observed in Chile. The literature also points out another issue that needs to be studied; the transition from temporary to permanent work. If firms use temporary contracts as a screening mechanism, the reduction in the probability of receiving training cannot be considered a serious problem. However, if the transition from temporary to permanent work is low, the effect on the probability of receiving training is worrisome because there is a proportion of the workers that never receive training.

3. Temporary work and training in Chile

A first look at The World Bank Doing Business 2010 shows that regulations of employment in Chile look similar to those in OECD countries. However, when the general rigidity index is

separated into its components some important differences come out. In term of firing costs, Chilean firms have to pay twice as much as firms in OECD countries. A Chilean firm has to pay 52 weeks of salary in terms of severance payment⁷ while a firm in the average OECD country only has to pay 26 weeks of salary. Similarly, the difficulty hiring index is higher in Chile than OECD countries. These differences explain, at some extent, the low percentage of permanent workers in Chile compared to OECD countries—in the period 2004-2007, 88 percent of workers were permanent in OECD and only 83 in Chile—and why the turnover rate in Chile is considerable higher than in OECD countries—in OECD countries workers are in average ten years in one firm, in Chile only four.⁸ This effect of the EPL on the proportion of temporary workers would be consistent with the results from Aterido and Almeida (2008) and Bassanini et al. (2005).

In terms of human capital accumulation, Chile lags behind other OECD countries not only in terms of education but also in the proportion of workers receiving training. In 2005, 33 percent of workers received training in OECD countries and only 23 percent in Chile.⁹ According to SENCE, the Chilean National Training and Employment Service, in 2009 the percentage of workers receiving training in Chile was 15 percent—a magnitude considerably lower than other Latin American countries, in the same year, 24 percent of workers in Uruguay and 21 percent of workers in Peru and Colombia received training. In addition, even though the level of education has been increasing steadily,¹⁰ the human capital component for the global competitiveness index¹¹ is still below the other components of the index. These facts have lead to a consensus about the necessity of a continuous effort in human capital investment.

Chile has long tradition of job training promotion and invests significant government resources in training initiatives (600M USD in 2009). Public policy focused on encouraging training for the workforce is managed by SENCE and executed through different instruments. *Franquicia Tributaria* (Tax Exemption) and a number of training programs represent the main ones. *Franquicia Tributaria*, which accounts for the 60% of the total public resources devoted to training initiatives, allows firms with a payroll higher than 35 tax units (UTM)¹² to discount the costs of training from payable income taxes. This instrument can cover up to 7 UTM for small firms (35-45 UTM payroll), up to 9 UTM for firms with 45-900 UTM payrolls; and 1 percent of the payroll for large firms (higher than 900 UTM payroll). In addition, the Chilean government offers subsidies for training to different groups; for instance, unemployed, low skilled workers

⁷ The beneficiaries of the severance payment are unemployed who had an open-ended formal contract, had been working for at least 12 months consecutively and were fired due to the firm needs.

⁸ To our knowledge, there are no papers studying the causal relation between EPL and the proportion of temporary work and turnover in Chile. In this paper, we do not aim at filling the gap. Instead we consider this correlation as stylized fact and we do not claim causality.

⁹ OECD data come from Eurostat. Chilean data come from the 2006's Social Protection Survey and the reference period is 2004-2006.

¹⁰ According the Social Protection Survey the average number of years of formal education of the mother of the interviewee is approximately half of the education of the interviewed.

¹¹ World Economic Forum, 2009.

¹² Unidad Tributaria Mensual (UTM) is a Chilean currency unit to calculate taxes, fines and custom duties. Its value is determined by law and permanently actualized. In February 2011, an UTM was equivalent to 80 USD. Source: Servicio de Impuestos Internos.

and vulnerable people without direct access to *Franquicia Tributaria*, young workers, female household-head, adult household-head, and micro and small firms.

In spite of all the money and effort devoted to the promotion of training, there is almost no empirical evidence about the efficacy and efficiency of these instruments¹³. However, some indicators shed light on possible large gains from monitoring, evaluating, and restructuring. Program coverage is low and the programs seem to lack a precise targeting population. For instance, in 2008, only 22 percent of public resources were directed to low income groups and only 12 percent of the resources of *Franquicia Tributaria* reached low or semi-skilled workers.¹⁴ At the same time, the training incidence rate declared by the higher quintile doubles the rate for the lowest quintile (CASEN 2006). In terms of training supply, the evidence suggests that it is limited and that there is a mismatch between the courses provided by the institutions and the demand of courses by firms. For instance, the 2008's *SME Survey* shows that SMEs do not invest in training because of the low quality of offered courses and their lack of relevance to the needs of the firms. Finally, it should be noted that performance management indicators and quality standards have not been developed.

Workforce training constitutes a main priority for the new Chilean government. It plans to create 200,000 jobs and offer training to 1,000,000 workers per year in the next 4 years. The main mechanism to promote workers' human accumulation will be a voucher program called "*Bono de Capacitación*".¹⁵ This is an innovative mechanism that could change the way Chile manages training related issues. Moreover, a voucher system might be an opportunity to institute a labor training system that is cost-effective, coherent, integrated, sustainable, targeted, and with higher coverage. However, before jumping in this direction, it seems worthwhile to understand the strengths and weaknesses of the status quo (Barnow, 2009).

4. Data and Descriptive Statistics of the Sample

We use data from *Social Protection Survey* (EPS, Encuesta de Protección Social) carried out by *Subsecretaría de Previsión Social* in Chile. The survey collects information for 2002, 2004, 2006, and 2009. In 2002 the sample was representative of the population older than 15 years

¹³ There are few quasi-experimental impact evaluations corresponding to ended programs. Aedo and Pizarro (2004) is one of the most rigorous impact evaluation performed. They evaluated the labor training program for youths, Chile Joven.

¹⁴ Whether or not training should be targeted to low income people it is a matter of debate. On the one hand, it would depend on whether training is more effective for low income people. If not, poverty alleviation could be achieved by devoting those resources to other programs like Conditional Cash Transfers. On the other hand, there is an issue of equality of opportunities. In Chile, evidence provided by the national System for Measuring Educational Quality (SIMCE) during the 1990s revealed that the education system is based on a socially stratified structure, with performance highly dependent on the socio-economic conditions of the student's family. In this way, low income population receives less formal education and because of this, firms offer less training. From this perspective, training is a short term solution to a problem that could be solved in the long run through education or other policies. Until recently, the per-student subsidy was disassociated from students' socio-economic background. In an effort to tackle this issue, in January 2008 the Chilean government introduced a differentiated voucher scheme for preprimary, primary and lower-secondary education that enables an increase of funding for schools hosting students from socially disadvantaged backgrounds (See OECD, 2009).

¹⁵ President Piñera's Speech to National Congress, May 21, 2010.

affiliated to the pension system between 1981 and August 2001. In 2004 the sample was redesigned to add those not affiliated to the pension system and the minimum age for being sampled was moved to 18 years old. Consequently, after 2004, the EPS has been based on a sample that is representative of the total population older than 18 in December 2003. Important efforts have been done to collect panel information. In 2006 two questionnaires were applied; one for those households interviewed in 2004¹⁶ and the other for households that were interviewed in 2002 and because of some reason were not reached in 2004.¹⁷

The survey contains information about employees (permanent and temporary), self-employed, employers, unemployed, and economically inactive individuals. Given that we are interested in the effect of the type of contract on the probability of receiving training, we use only the information about employees. Appendix A provides a full description of the dataset and the criteria used to clean it. The number of workers in our sample is 6,274 and the number of observations is 11,864.

Individuals are asked about their labor market variables (type of contract and wages), personal characteristics (age, gender, and education), their family characteristics (marital status, children, education of the mother and father, characteristics of the household in which they grew), and the characteristic of the firm for which they work for (size, industry, and location). Table 2 shows the definition of the main variables in our analysis.

[Table 2 here]

Table 3 shows the descriptive statistics of the sample for the main variables. The proportion of permanent employees in the sample was around 0.83 in 2002, 2004 and 2006 and 0.90 in 2009. The increase in 2009 reflects the fact that the recession destroyed more temporary jobs than permanent jobs. The proportion of workers that received training in the previous two years of the survey was 0.26 in 2002, 0.22 in 2004 and 2006, and dropped to 0.12 in 2009. Considering only the training that was financed by the firm in which they work these numbers fell to 0.17 in 2002, 0.14 in 2004 and 2006, and 0.08 in 2009.

Only 38 percent of the individuals in the sample are women. In the population this share is 50 percent and the difference is explained because of the large percentage of women who are economically inactive. The average individual in the sample is 39 years and has 11.6 years of formal education. Women have on average one year more of education than the average individual. The percentage of married individuals is large; it is around 60 percent.

[Table 3 here]

Table 4 shows the relationship between training and other variables like type of contract, education, gender, and size and sector of activity of the firm in which they work. There are several interesting patterns coming out from this table. First, there is a correlation between type of contract and training. While 24.8 percent of permanent employees received training, only 12.9 percent of temporary employees did. As a result of the recession, these percentages are considerably lower in 2009—12.1 and 6.8 percent, respectively.

¹⁶ The sample of those interviewed in 2004 includes individuals who were interviewed first in 2002 and then in 2004, and individuals who were interviewed for the first time in 2004.

¹⁷ Mobility of the interviewee explains most of the cases that were not interviewed in 2004

[Table 4 here]

Second, the relationship between training and education is also evident; 41.9 percent of individuals with a university degree received training and only 5.7 percent of individuals with initial or no education received training. Third, gender is also important; the proportion of women (26.4) that receive training is larger than the proportion of men (20.7 percent). Fourth, in terms of the size of the firm, 41.2 percent of the workers of firms with more than 500 employees received training. This percentage is lower than 10 percent in firms with fewer than ten employees. In terms of the economic activity of the firm, it is clear that some sectors provide more training than others. The percentage of workers that received training in construction or agriculture is close to 10 percent. On the other hand, around 30 percent of workers in mining, the production and distribution of electricity, gas, and water, and those working in financial services, insurance, and real estate received training.

5. Empirical strategy

The main question we aim at answering in this paper is: does the type of contract affect training? In particular, we pay attention to: (i) the probability of receiving employer-paid training and (ii) the probability receiving any type of training. The estimating equation is:

$$P(y_{it} = 1) = g(\alpha_1 \text{temp}_{it} + \mathbf{w}_{it}\boldsymbol{\beta}_1 + \mathbf{f}_{it}\boldsymbol{\beta}_2 + \eta_t), \quad y = \{eptr, tr\}, \quad (1)$$

where $g(\cdot)$ is a cumulative distribution function, $eptr_{it}$ is a dummy variable that takes value one if worker i received employer-paid training in the last two years, and tr_{it} is a dummy variable that takes value one if worker i received training in the last two years, independently of who financed it. In the category of any type of training we include the training that is paid by employers, family, government, and unions. The variable $temp_{it}$ is a dummy that takes the value one if worker i has a fixed-term contract in period t . We use the notation \mathbf{w}_{it} for a vector of worker's characteristics; namely, education, age, age squared, marital status, gender, number of children under five years old, and the region of residence. Most of these variables are time invariant—or are time invariant for a high proportion of the workers in our sample. We denote \mathbf{f}_{it} as a set of characteristics of the firm for which employees work; we include a dummy for public sector, dummies for the size of the firm, and dummies for the sector of activity. Finally, η_t is a set of year dummies. Controlling for year is important because, as we mentioned above, the international crisis of 2008 affected the proportion of temporary workers and the proportion of workers that received training in 2009.

If all the regressors in equation (1) were exogenous, the coefficients of this equation could be consistently estimated by replacing $g(\cdot)$ by the normal or logistic distribution and then the maximum likelihood estimator (MLE) would have a causal interpretation. In this case, consistent estimates of the average marginal effects can also be reached considering a linear probability model (LPM), i.e. $g(z) = z$, and estimating by OLS. However, if any regressor is endogenous, it is necessary to find instruments and the functional form of $g(\cdot)$ becomes relevant. In the linear case it is well known that a good instrument is a variable that is partially correlated with the endogenous variable and uncorrelated with the error term. In the nonlinear case, the absence of

correlation is not enough. Instruments have to be independent of the error term; a considerably stronger assumption.

Education is an endogenous variable because it is correlated with the unobserved –for the researcher—ability and ability is correlated with the probability of receiving training. The correlation between ability and the probability of receiving training comes from the fact that firms can have some measure of the ability of their employees and therefore they can offer training to those employees with higher learning capabilities (higher ability).

We instrument the number of years of education with the number of years of education of the mother, the number of times workers repeated a year during their basic studies, a dummy variable that takes value one if the worker grew up in an indigent household, and a dummy variable that takes value one if the worker grew up in a poor household. These instruments are valid as long as they are correlated with the number of years of education of the individual and only correlated with receiving training through education.

The correlation between years of education and year of education of the mother has been justified in the literature by the assumption that highly educated mothers value education and therefore they generate incentives for their children to study. In principle, there is no reason of a correlation between mother education and the probability of receiving training different than the correlation through the education of the worker.¹⁸

It is possible to expect a negative correlation between the number of times workers repeated a year in basic school and their years of education. The longer students are in school the higher the opportunity cost of studying and therefore it is likely that a child that repeated years of basic education accumulate less years of formal education. UNESCO (1996) summarizes several studies showing that repetition affected dropout rates. The other condition that this variable needs to satisfy for being a good instrument is to affect the probability of training only through the years of education. This condition would not be satisfied if repetition is correlated with ability. In 1967 Chilean legislation established automatic promotion from the first to the second course of basic education for students attending more than 75 percent of class days (Schiefelbein and Schiefelbein, 1999). Therefore, the correlation with ability, if any, has to be small.

As in the case of the number of times workers repeated a year in basic education, the correlation between years of education and socio-economic condition of the household in which the worker grew up appears because of the opportunity cost of studying. The association between socio-economic causes and final school dropout is a well documented fact, especially in the case of children over 10 years old, who can begin to be a source of additional income or to lend a hand in domestic or farming work (UNESCO, 1996). The direct cost of education is also important in driving the correlation between number of years of education and the socio-economic condition. The second condition that the socio-economic condition needs to fulfill to be a valid instrument is that its correlation with the probability of receiving training has to be only through education. In particular, it has not to be correlated with ability which is a reasonable assumption.

¹⁸ If ability can be inherited then the number of years of education would not be a good instrument. In this case, the ability of the mother would be correlated with her education and with the ability of the worker.

Temporary work can also be an endogenous variable. Having a temporary work depends on the quality of the firm. Low productive firms have higher probability of exiting the market and therefore they hire workers with temporary contracts. Given the strong correlation between size and productivity (see, for example, Pages, 2010) controlling by size becomes important. In this case, it is less likely to observe a correlation between having a temporary contract and ability. However, if they are correlated, the instruments mentioned above are good instruments. The socio-economic condition of the household in which the worker grew up can be correlated to the type of contract if, for example, networking allow individuals to obtain permanent jobs and low income households has less probability of networking. In addition, they are not correlated to ability.

As mentioned above, when some regressors are endogenous, the functional form of $g(\cdot)$ is important for the conditions required for the instruments. In addition, if the endogenous variable is binary—like having a temporary contract—MLE is nontrivial to compute and, because of the nonlinearity, it is not possible to apply a two stage procedure (see, Wooldridge, 2002). To estimate binary models with endogenous covariates the literature have recommended to use the LPM and apply 2SLS (see, Angrist and Pischke, 2009 ch. 4). In this paper we follow this strategy. The LPM is heteroskedastic by construction and robust standard errors are needed to obtain consistent estimates of the standard errors. Moreover, we have repeated observations for the same individuals and therefore it is also necessary to use cluster standard errors by individual to account for the correlation in the error term of the same individual.

Most of the literature considered the dummy variable for being a temporary employee as exogenous (see Table 1). The endogeneity of this variable can be tested using the Hausman-Wu test. Our maintained assumption is that education is endogenous. Under the null hypothesis that holding a temporary contract is exogenous, the coefficient of temporary employee obtained by 2SLS assuming that education is endogenous and temporary employee is exogenous is equal the coefficient of temporary employee obtained by 2SLS assuming that both education and temporary employee are endogenous. Given the heteroskedasticity in the LPM, the variance of the difference in the coefficients in each 2SLS is not equal to the difference in the variance of the coefficients. Therefore, to estimate the variance of the difference in the coefficients we use block bootstrap.

6. Empirical Results

The probability of receiving employer-paid training

Table 5 shows the results of estimating equation (1) with y replaced by $eptr$ (employer-paid training). Column (1) shows the average marginal effects from a probit model in which all the regressors are considered to be exogenous. Column (2) shows the marginal effects estimated using a LPM under the same assumption. It is interesting to note that the estimated marginal effects for the probit and LPM are similar. This result suggests that working with the LPM is a reasonable strategy. Columns (3) and (4) show the 2SLS estimate assuming that education is endogenous and education and temporary employee are endogenous, respectively. We use robust standard errors clustered by worker in all of our estimations.

[Table 5 here]

As mentioned above, we test for the endogeneity of the type of contract using the Hausman-Wu test on the coefficient of *Temporary employee* estimated in columns (3) and (4). The null hypothesis of exogeneity is that these two coefficients are equal. The test statistic is 0.857 and its p-value is 0.355 (last row of column (4)); therefore the null hypothesis is not rejected. Given that the exogeneity of the type of contract is not rejected we focus on column (3) that gives more precise estimates.¹⁹

The 2SLS estimates in column (3) satisfy all the specification tests. The F-test for the excluded instruments in the first-stage (number of years of education of the mother, dummy for repeating one grade in basic school, dummy grew in a poor household, and dummy grew in an indigent household) rejects the null hypothesis that the coefficient of these variables in the Temporary employee equation is zero; the F-statistic is 416.85 and its p-value is zero. The large value of the F-statistic suggests there is no problem of weak instruments. The Hansen J statistic does not reject the null hypothesis that the correlation between the excluded instruments and the error term is zero. The value of the Hansen J statistic is 4.86 and the p-value is 0.18. Table A3 in the Appendix shows the estimates of the first-stage.

The effect of the type of contract: Having a temporary contract reduces the probability of receiving employer-paid training in 0.035. This coefficient is quantitatively and statistically significant. The (unconditional) probability of receiving employer-training for a temporary worker is 0.07. Therefore, if a temporary worker obtains a permanent contract, her/his probability of receiving employer-paid training increases 50 percent, 0.035/0.07.

The effect of worker characteristics: The effect of *education* is positive and statistically significant; one extra year of formal education increases the probability of employer-paid training in 0.01. The effect of *age* is also positive and there is evidence that the effect is decreasing in age. Gender, marital status, and the number of young children do not affect the probability of training. There is an interesting pattern related to region. Living in Antofagasta increases the probability of receiving training by 0.06.

The effect of firm characteristics: Being a *public sector employee* does not increase the probability of receiving employer-paid training. On the other hand, there is a strong relationship between the *size of the firm* and the probability of receiving employer-paid training. This result is consistent with previous literature; see for example, Almeida and Aterido (2010).²⁰ The *sector of activity of the firm* is also important. Working in mining increases the probability of receiving employer-paid training by 0.072.²¹ This result helps to understand the positive effect of the Antofagasta dummy; copper producers are characterized for providing training to their

¹⁹ Although the value of the coefficient for temporary employee in column (4) is larger (in absolute value) than the coefficient in column (3), its standard deviation is also considerably larger. Therefore, even with a larger coefficient it is not possible to reject the null hypothesis. One reason for the large standard deviation is the fact that the instruments have no time variation and the variable *Temporary employee* changes for some individuals.

²⁰ Using firm level data for 99 developing countries, Almeida and Aterido (2010) find a positive relationship between firm size and the investment in job training by employers. Their findings do not support the view that this difference is mostly driven by market imperfections disproportionately affecting SMEs. Rather, their evidence is supportive of SMEs having a smaller expected return from the investment in job training than larger firms.

²¹ The excluded sector in the regression is Social Services.

employees and Antofagasta concentrates more than 50 percent of the copper production in Chile. The other sector with a positive effect is Financial Services, Insurance, and Real Estate; working in this sector increases the probability of receiving employer-paid training by 0.037.

Column (5) shows the estimate of the average marginal effects of the probit model assuming that the number of years of education is endogenous. In this case, as mentioned above the assumption is that instruments are independent of the error term. Like in the case in which all the regressors were assumed to be exogenous, the average marginal effects of the probit model are close to the marginal effects of the LPM in column (3).

A final robustness check is presented in columns (6), (7), and (8). These columns show the estimates of a LPM with unobserved heterogeneity at the worker level assuming random effects.²²

The probability of receiving training independently of its funding

Table 5 shows that temporary workers have a lower probability of receiving training at their job. Now we focus on training independently of who finances it. The idea is to check if the training deficit due to employer-paid training is filled by other types of training. Therefore, we replace the dependent variable, y , by a dummy variable that takes value one if the individual received training independently of who financed the training; this definition includes training financed by employers, family, government, and unions. Table 6 shows the results of this estimation.²³

[Table 6 here]

The average of the marginal effect of the probit model for all the variables is close to the corresponding marginal effect of the LPM and we concentrate in the estimates of the LPM. The Hausman-Wu test does not reject the exogeneity of *Temporary employee*; the statistics is 0.385 and its p-value is 0.535. Therefore, like in the case of employer-paid training, we focus on the estimates in column (3).

Unless otherwise noted, results are similar to those of employer-paid training. The marginal effect of *Temporary employee* is -0.04; therefore, it is possible to conclude that the deficit in employer-paid training is not covered by other types of training.

It is interesting to note that *single women with young children* have a lower probability of receiving any training. This result, combined with the previous result that firms do not offer less training to this group, indicates the single women with young kids have a lower probability of receiving other types of training. Given that most of the other type of training is voluntary—and there are public training programs free of charge for this group—this result reflects the decision of this group in not participating in training programs. This decision may be result of other type of constraints—e.g. time and credit constraints or lack of childcare services.

²² Random effect imposes stronger assumptions than fixed-effects (i.e. no correlation between explanatory variables and unobserved heterogeneity) but allow us to obtain the coefficient of time invariant variables. This advantage is important in our case because, as mentioned above, most of the explanatory variables are time invariant or are time invariant for a large proportion of the sample.

²³ The difference between Tables 6 and 5 is only in the dependent variable.

Workers living in Regions 7, 8, and 10 have higher probability of receiving any training but not higher probability of receiving employer-paid training. This means that workers in these regions have higher probability of receiving training financed by themselves, government, or unions.

Being a *public sector employee* increases the probability of receiving training. It is interesting to note that the effect on employer-paid training was zero and therefore being a public sector employee increase the probability of receiving other type of training different from employer-paid training.

In terms of *sector of activity of the firm*, working in Agriculture, Hunting, and Fishing, Manufacturing, Construction, and Commerce reduce the probability of receiving training. Given that we cannot say that the effect on employer-paid training is different from zero, it seems that workers in those sectors have lower probability of receiving other training. On the other hand, working in Mining or Financial Services, Real Estate, and Insurance do not affect the probability of receiving training. We saw above that working in these sectors increases the probability of receiving employer-paid training. Therefore, we conclude that workers in these sectors have lower probability of receiving other type of training.

Column (5) shows the estimate of the average marginal effects of the probit model assuming that the number of years of education is endogenous. Columns (6), (7), and (8) show the same estimates as columns (2), (3), and (4), respectively, assuming there is unobserved heterogeneity at the worker level and estimated using random effects. We estimate these columns using random effects. The magnitude of the marginal effects is similar to the marginal effects estimated in column (3) confirming the robustness of the results.

7. Temporary contracts: Stepping stones or dead ends?

It is important to know if temporary contracts are “stepping stones” or “dead ends”, using Booth et al.’s (2002) terminology. If temporary employment is a stepping stone, then the problem of lack of training is not so serious because they will receive training when they reach an open-ended contract. On the other hand, if a large proportion of the population changes from one temporary contract to other temporary contract without reaching a permanent contract, the problem becomes evident because there is a proportion of the population that do not have access to training.

To address this issue it is useful to study the transition probabilities from one type of contract to the other. Workers not only can move from one type of contract to the other, they can also move to self employment, unemployment, or become inactive. To consider these possibilities we expand our sample to include them. Table 7 shows the transition matrices. Panel (a) shows the transition from one wave of the survey to the other—i.e. 2002 to 2004, 2004 to 2006, and 2006 to 2009—and panel (b) considers longer periods—i.e. it presents the transition from 2002 to 2006 and 2004 to 2009.

[Table 7 here]

The first matrix in panel (a) shows the labor market transition from 2002 to 2004. Permanent workers, self employed or entrepreneurs, and inactive show the higher persistence; i.e., 56.09 percent of permanent workers in 2002 remain as permanent workers in 2004, 42.84 percent of self employed or employers in 2002 remain as self employed or employer in 2004, and 52.86 percent of inactive in 2002 remain inactive in 2004. In terms of the transition from temporary to permanent work this matrix shows that 31.22 of temporal workers in 2002 moved to a permanent work in 2004. If we take into account that the period covers two years, this percentage is low. In Spain, a country with low conversion of temporary contracts into permanent contracts, the percentage for consecutive years is close to 10 percent. The transitions from 2004 to 2006 and 2006 to 2009 show similar patterns.

It is interesting to note that the conversion from temporary to permanent work is decreasing in time; 25.65 percent of temporary workers in 2004 move to a permanent work in 2006 and 29.69 percent of temporary workers in 2006 move to a permanent work in 2009. To realize that the conversion is decreasing even in the last period it is necessary to consider that this period covers three years instead of two.

These transition matrices also show that, as expected, the probability of moving to unemployment is larger for temporary workers than for permanent or self employed or employers. Another issue related to unemployment is its high persistence. For example, 21 percent of unemployed in 2002 are unemployed in 2004. This does not mean that they were always unemployed during this period but it if they found a job it was for a short period of time.

The exit from our sample is because the individuals were not interviewed. The exit of individuals from the sample is not negligible—from one wave of the survey to the other, around 20 percent of individuals leave the sample and if we consider two waves, the exit rate is 25 percent—but attrition does not seem to be problem because the exit from the sample is not related to labor market status. It is possible that some temporary workers that left the sample reached a permanent job. If this is the case, Table 7 underestimates the conversion rate. On the other hand, if workers that left the sample are still working as temporary workers, the persistence of temporary work is underestimated. A priori there is no reason to assume that not being interviewed is correlated to the type of contract. Therefore, the estimates are good approximations of the actual conversion rates.

8. Conclusions

This paper studies the effect of temporary work on the probability of receiving any form of training as well as employer-paid training. This issue is important in Chile because the country faces a productivity slowdown and human capital accumulation could be one of the solutions to this problem. And given there is no empirical evidence on this subject from other Latin American countries, the findings might be also valuable for those countries in the region that meet optimistic economic growth forecast joint with low productivity and poorly skilled labor force.

We find that holding a temporary contract reduces the probability of receiving this type of training by 0.035. This magnitude is quantitatively important because the unconditional

probability that a temporary worker in Chile is 0.07. Therefore, if a temporary worker achieves a permanent contract, her/his probability of receiving training increases in 50 percent.

We also find that the deficit in employer-paid training is not filled by other types of training. This result suggests not only that training policies for this group do not compensate for the training deficit, but it also shows that there could be other constraints for temporary workers. It may also be the case that they have low incentives to take training. Although this issue is important, it is beyond the scope of this paper.

The lack of training for temporary workers would not be a problem if temporary employment were a stepping-stone. In this case, workers would receive training after they reach a permanent job. We analyzed the transition from temporary to permanent work after two years. The proportion of temporary workers that reach a permanent job is low. This conversion is comparable to the conversion rate in Spain, the European country with the highest proportion of temporary workers and one of the lowest conversion rates.

The proportion of temporary workers in Chile is close to 0.2, this proportion is well above the average of OECD countries. Temporary employment could be an issue to consider in the design of public policies because of several reasons. Temporary workers receive less training than permanent workers and they have low probability of achieving a permanent contract. Moreover, the transition from temporary to permanent work shows a decreasing trend in the last decade. In addition, our results show that the training deficit is not compensated by public policy or the investment in training by temporary workers. This combination has adverse consequences for temporary workers' wellbeing and, at the aggregate level, can affect the productivity of the economy.

Our findings shed light on issues that are sometimes ignored in the policy design and can affect the effectiveness of the policies. The results in this paper suggest that further research is needed in several directions. The case of single women with young children is particularly interesting. Our results show that firms do not offer less training to this group, conditional on offering some training. However, they do have lower probability of receiving training. The lack of incentives or the presence of constraints could explain this result. Chile recognizes this group as vulnerable and several policies, including training policies, are targeted towards them. Our results motivate a study of the efficiency of the targeting and suggest a possible benefit of combining training policies with other type of policies, for example, childcare. The transition from temporary to permanent work should also be analyzed. The group of workers with lower conversion probability might be particularly important targets for training policies. Our results also suggest that temporary workers have higher probability of exiting the sample of workers. This result invites to study the transition to unemployment. It is likely that temporary workers also have higher probability of becoming unemployed. The reduction in the proportion of temporary workers in 2009 provides evidence in this direction. Finally, but not less worthy, this paper also underlines the need of reinforcing the investment in generating data and producing evidence in Latin American countries to improve policies design and implementation.

9. References

- Aedo, Cristian y Pizarro, Marcelo (2004): “Rentabilidad Económica del Programa de Capacitación Laboral de Jóvenes Chile Joven”, mimeo.
- Albert, C., C. García-Serrano, and V. Hernanz (2005): “Firm-provided training and temporary contracts,” *Spanish Economic Review*, 7, 67-88.
- Almeida, R. and R. Aterido (2008): “The incentives to invest in Job Training: Do Strict Labor Codes Influence this Decision?” Social Protection Discussion Paper No. 0832, The World Bank, Washington, DC, USA.
- Angrist, J. and J. Pischke (2009): “*Mostly Harmless Econometrics: An Empiricist’s Companion*,” Princeton University Press.
- Almeida, R. and R. Aterido (2010): “The Investment in Job-Training: Why are SMEs lagging so much behind,” IZA Discussion Paper No. 4981.
- Amuedo-Dorantes, C. (2000): “Work Transitions into and out of Involuntary Temporary Employment in a Segmented Market: Evidence from Spain,” *Industrial and Labor Relations Review*, 53(2), 309-325.
- Arulampalam, W. and A. Booth (1998): “Training and labour market flexibility: Is there a trade-off?” *The British Journal of Industrial Relations*, 36(4), 521-536.
- Arulampalam, W., A. Booth, and M. Bryan (2004): “Training in Europe,” *Journal of the European Economic Association*, 2(2-3), 346-360.
- Barnow, Burt S. (2009): “Vouchers in U.S. vocational training programs: an overview of what we have learned,” mimeo.
- Bassanini, A., A. Booth, G. Brunello, M. De Paola, and E. Leven (2005). “Workplace Training in Europe”, IZA Discussion Paper No. 1640.
- Booth, A., M. Francesconi, and J. Frank (2002): “Temporary Jobs: Stepping Stones or Dead Ends?” *The Economic Journal*, 112(480) F189-F213.
- CNIC (2006): “Hacia una Estrategia Nacional de Innovación para la Competitividad,” vol. I. Consejo Nacional de Innovación para la Competitividad, Santiago, Chile, 2006.
- D’Addio, A. and M. Rosholm (2005): “Exits from temporary jobs in Europe: A competing risks analysis,” *Labour Economics*, 12(4), 449-469.
- Gagliarducci, S. (2005): “The dynamics of repeated temporary jobs,” *Labour Economics*, 12(4), 429-448.
- Güell, M. and B. Petrongolo (2007): “How binding are legal limits? Transitions from temporary to permanent work in Spain,” *Labour Economics*, 14(2), 153-183.
- OECD (2009): “OECD Territorial Reviews: Chile,” OECD Publishing, Paris, France.

- Pages, C. Ed (2010) “The age of productivity: Transforming economies from the bottom up,” Palgrave-McMillan.
- Portugal, P. and J. Varejão (2009): “Why firms use fixed-term contracts?” IZA DP No. 4380.
- Sauermann, J. (2006): “Who invests in training if contracts are temporary? Empirical evidence for Germany using selection correction.” IWK-Discussion Papers, No. 14, Institut für Wirtschaftsforschung Halle.
- Scherer, S. (2004): “Stepping-Stones or Traps? The Consequences of Labour Market Entry Positions on Future Careers in West Germany, Great Britain and Italy,” *Work, Employment, and Society*, 18(2), 369-394.
- Schiefelbein, E. and P. Schiefelbein (1999): “Repetition and quality of education in Chile,” ch. 9 in L. Randall and J. Anderson Ed. *Schooling for success: Preventing repetition and dropout in Latin American primary schools*, Sharpe, Inc., New York.
- UNESCO (1996): “Primary school repetition: A global perspective,” International Bureau of Education, UNESCO, Geneva, Switzerland.
- Wallette, M. (2005): “Temporary jobs and on-the-job training in Sweden: A negative nexus?” mimeo.
- Wooldridge, J (2002): “*Econometric Analysis of Cross Section and Panel Data*,” The MIT Press, Cambridge, Massachusetts, USA.
- World Bank (2010): “*Doing Business 2010*,” The World Bank and the International Finance Corporation, Washington DC, USA.
- World Economic Forum (2009): “*The Global Competitiveness Report 2009-2010*,” World Economic Forum, Geneva, Switzerland.

10. Appendix: Data

We use data from four waves of the Social Protection Survey (EPS, Encuesta de Protección Social) covering the period 2002-2009. Given that the surveys ask questions for current and past years, our study covers the period 2000-2009. In 2002 the sample was representative of the population older than 15 years affiliated to the pension system. More precisely, the sample was selected from all the individuals affiliated to the pension system between 1981 and August 2001. The sample was redesigned in 2004 to add those individuals not affiliated to the pension system. In 2004 the minimum age for being sampled was moved to 18. Consequently, after 2004, EPS is based on a sample that is representative of the total population older than 18 in December 2003. In 2006 there were two groups of respondents: those not interviewed 2004 and those who were

interviewed in 2004. The sample of those interviewed in 2004 includes individuals who were interviewed first in 2002 and then in 2004, and individuals who were interviewed for the first time in 2004. The sample of those not interviewed 2004, on the other hand, corresponds to those individuals who were interviewed first in 2002 but could not be reached for the interview in 2004—mobility of the interviewee explains most of the cases that were not interviewed.

The total number of observations in the dataset is 310,150—71,842 in 2002, 83,160 in 2004, 81,101 in 2006 and 74,047 observations in 2009. There are 104,405 individuals and 21,051 of them were interviewed—the difference is because as we mention above only one person was interviewed per household and this person provided some information about the rest of members of the household. The information of the other members of the household does not cover labor market information and therefore we focus the analysis on those interviewed.

We classify individuals according their labor market status as follows: (i) employee with an open-ended contract (permanent employee), (ii) employee with a fixed-term contract (temporary employee), (iii) employer or self-employed, (iv) unemployed, and (v) economically inactive. Given that we are interested in the effect of the type of contract on the probability of receiving training we focus our attention in (i) and (ii).

Important efforts have been made to collect panel data and in each wave interviewers went to the same households. However, when the person interviewed in previous waves was not available several times, the interviewer asked information to other member of the household. Because of this reason, it is not straightforward to construct a *panel of individuals*. We followed the following criteria to determine if the interviewed is the same person from one wave of the survey to the other: we asked for the following conditions:

- (i) No change in gender.
- (ii) In $t+1$ age cannot be lower than age in period t .
- (iii) In period $t+1$ age cannot be larger than the age in t plus 3 years (there are two years between each wave).

Table A1 shows the number of observations that satisfy and do not satisfy these conditions. Table A2 shows the structure of the panel.

[Tables A1 and A2 here]

Table 1: Temporary work and training in the literature

Study	Country and period	Method	Findings
Arulampalam and Booth (1998)	UK (1991-1995)	Random effect probit model for training. All regressors are considered to be exogenous	Workers on short-term employment contracts, who are working part-time, or who are not covered by a union collective agreement, are significantly less likely to be involved in any work-related training to improve or increase their skills.
Arulampalam et al (2004)	Austria, Belgium, Denmark, Finland, France, Ireland, Italy, Netherlands, Spain, UK (1994-1999)	Random effect probit model for training. All regressors are considered to be exogenous (to avoid problems of simultaneity, they use all explanatory variables at the wave prior to the wave where the training information was elicited)	In several countries there is a negative association between fixed-term contracts and training, particularly for men. Other findings: Women are no less likely than men to undertake training and considerably more likely to train in four countries. There is no significant training age profile for women and a strong negative profile for men. In most countries, training is positively associated with public sector employment, high educational attainment and a high position in the wage distribution.
Wallete (2005)	Sweden (1995-2000)	Number of hours of training on temporary workers. Heckman sample selection equation for receiving training.	Temporary workers receive less on-the-job training than open-ended jobholders. However, conditional on a worker receives on-the-job training, it is not automatically the case that the amount of on-the-job training is lower for all temporary jobholders.
Albert, et al (2005)	Spain (1998-2002)	Probit and Heckprobit models for the probability of participating in firm-provided training.	Temporary contracts not only are less likely to be employed in training firms but, once they are in those firms, they also have a lower probability of being chosen to participate in firm-provided training activities.
Bassanini, et al (2005)	Austria, Belgium, Denmark, Finland, France, Greece, Ireland, Italy, Netherlands, Portugal, and Spain (1995-2001)	Probit model for the probability of receiving employer and employee paid training. All regressors are considered to be exogenous.	The probability of receiving training of temporary workers is lower than the corresponding probability of permanent workers. Temporary workers are willing to pay for their training and they pay it more often than permanent workers.
Sauermann (2006)	Germany (1997-2004)	Probit model for the effect of fixed-term contracts on employer and employee paid training. Fixed-term contracts are considered endogenous variables and are instrumented using risk aversion and working overtime.	Temporary workers receive less employer-sponsored training and that their investments in employee-sponsored training do not compensate the lower investments of the firm.

Table 2: Variable Definitions

Variable	Definition
Training	
Training	Dummy variable that takes value one if individual received training in the previous two years.
Employer-paid training	Dummy variable that takes value one if individual received employer-paid training in the previous two years.
Labor market	
Temporary employee	Dummy variable that takes value one if the individual is an employee with a fixed-term contract.
Public sector employee	Dummy variable that takes value one if the individual is a public sector employee.
Individual characteristics	
Age	Age in years.
Female	Dummy variable that takes value one if female.
Married	Dummy variable that takes value one if the individual marital status is married
Number of young kids	Number of sons and daughters less than five years old living with the interviewed.
Education	Number of years of formal education.
Region	Region where the individual lives.
Firm characteristics	
Firm size	Dummy variables by number of employees
Firm economic activity	Dummy variables by economic activity
Instruments	
Mother education	Years of education of the mother.
Repeated a course in basic education	Number of repeated course in basic education.
Grew in an indigent household	Dummy variable that takes value one if the individual grew in an indigent household.
Grew in a poor household	Dummy variable that takes value one if the individual grew in a poor household.

Table 3: Descriptive Statistics

	Total		2002		2004		2006		2009	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Number of Observations	11,864	-	5,019	-	3,085	-	2,340	-	1,420	-
Proportion of permanent employees	0.842	0.365	0.839	0.367	0.820	0.384	0.836	0.370	0.906	0.292
Proportion of temporary employees	0.158	0.365	0.161	0.367	0.180	0.384	0.164	0.370	0.094	0.292
Proportion of individuals the received training in last two years	0.229	0.420	0.266	0.442	0.225	0.418	0.222	0.416	0.116	0.320
Proportion of individuals the received employer-paid training the last two years	0.145	0.352	0.168	0.374	0.141	0.348	0.136	0.343	0.081	0.273
Proportion of women	0.380	0.485	0.384	0.486	0.381	0.486	0.378	0.485	0.370	0.483
Age (in years)	39.266	11.343	37.584	11.307	38.983	11.524	40.661	11.064	43.526	10.082
Education (in years)	11.681	3.625	11.712	3.622	11.512	3.670	11.776	3.648	11.780	3.489
Woman Education (in years)	12.704	3.212	12.760	3.152	12.514	3.246	12.719	3.392	12.895	3.025
Proportion of workers with young kids	0.178	0.383	0.208	0.406	0.179	0.383	0.169	0.375	0.147	0.354
Proportion of married	0.613	0.487	0.603	0.489	0.600	0.490	0.621	0.485	0.663	0.473
Mother education (number of years) ⁽¹⁾	6.500	4.177	-	-	-	-	-	-	-	-
Repeated a course in basic education ⁽¹⁾	0.364	0.710	-	-	-	-	-	-	-	-
Grew in an indigent household ⁽¹⁾	0.028	0.166	-	-	-	-	-	-	-	-
Grew in a poor household ⁽¹⁾	0.346	0.476	-	-	-	-	-	-	-	-

Notes: (1) Individuals are asked only once about this variable.

Table 4: Workers that received training, independently of who financed it

	2002-2009		2002		2004		2006		2009	
	N. Obs.	%	N. Obs.	%	N. Obs.	%	N. Obs.	%	N. Obs.	%
Labor market status										
Permanent Employee	2,456	24.77	1197	28.55	637	25.30	470	24.13	152	12.08
Temporal Employee	241	12.87	131	16.25	54	9.78	47	12.27	9	6.82
Education										
Initial or without education	77	5.68	32	5.36	24	6.43	14	5.65	7	5.11
Basic education	688	17.48	322	20.11	185	17.42	142	18.02	39	8.02
High school	1,268	26.37	637	30.33	320	26.17	233	25.16	78	13.93
Technical	165	33.07	79	37.98	45	34.88	31	29.52	10	17.54
University	497	41.91	256	52.35	117	41.34	97	36.74	27	18.00
Gender										
Male	1,514	20.71	729	23.64	399	21.00	294	20.23	92	10.51
Female	1,183	26.42	599	31.28	292	24.96	223	25.40	69	13.40
Size of the firm										
One employee	18	6.43	7	8.05	7	7.87	4	6.67		
Between 2 and 9	224	9.31	106	10.74	67	9.97	40	8.35	11	4.10
Between 10 and 19	213	15.37	96	16.96	54	14.21	49	17.56	14	8.70
Between 20 and 49	410	21.38	173	26.09	111	21.02	96	21.10	30	11.03
Between 50 and 99	333	23.94	146	27.19	103	26.75	63	21.21	21	12.21
Between 100 and 199	249	23.92	116	27.10	67	23.84	49	25.13	17	12.41
Between 200 and 499	318	28.73	140	31.82	87	28.34	70	29.41	21	17.21
500 or more	932	41.22	544	42.14	195	45.56	146	44.51	47	21.96
Economic Activity										
Agriculture, Hunting, Forestry and Fishing	115	9.50	39	9.75	46	10.80	25	10.08	5	3.65
Mining	63	32.14	31	38.75	11	25.00	17	38.64	4	14.29
Manufacturing	364	20.04	176	20.51	98	21.35	72	23.68	18	9.23
Electricity, Gas, and Water	34	31.78	18	39.13	8	29.63	5	26.32	3	20.00
Construction	130	12.73	54	13.40	39	14.34	26	11.61	11	9.02
Commerce, Restaurants and Hotels	420	19.42	234	24.00	87	15.96	71	17.93	28	11.34
Transport and Communications	230	24.81	115	28.75	57	25.00	44	23.04	14	12.96
Financial Services, Insurance and Real Estate	309	28.22	160	35.71	82	28.08	54	23.68	13	10.24
Social Services, Community Services, and Domestic Staff	1032	31.71	501	36.07	263	33.85	203	29.99	65	15.82

Table 5: The effect of temporary contracts on the probability of receiving employer-paid training

	Probit (Marginal effect)	LPM	LPM, 2SLS (edu)	LPM, 2SLS (edu, temp)	Probit, endog(edu), Marginal effect	LPM, RE	LPM, RE, 2SLS (edu)	LPM, RE, 2SLS (edu, temp)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Temporary employee	-0.046*** [0.0107]	-0.035*** [0.0078]	-0.035*** [0.0082]	-0.475 [0.3769]	-0.046*** [0.0109]	-0.034*** [0.0078]	-0.035*** [0.0095]	-0.475 [0.3762]
Years of education	0.0111*** [0.0010]	0.0101*** [0.0010]	0.0105*** [0.0022]	0.0015 [0.0081]	0.0109*** [0.0022]	0.0107*** [0.0010]	0.0105*** [0.0021]	0.0015 [0.0080]
Age/100	0.2903 [0.2020]	0.2356 [0.1715]	0.2332 [0.1718]	-0.037 [0.3025]	0.2912 [0.1948]	0.2373 [0.1705]	0.2332 [0.1798]	-0.037 [0.3037]
Age/100 squared	-0.456* [0.2402]	-0.337* [0.1929]	-0.331* [0.1955]	-0.194 [0.2498]	-0.458** [0.2341]	-0.340* [0.1918]	-0.331 [0.2099]	-0.194 [0.2576]
Married	0.0120 [0.0084]	0.0112 [0.0081]	0.0112 [0.0081]	0.0030 [0.0111]	0.0120 [0.0079]	0.0109 [0.0080]	0.0112 [0.0079]	0.0030 [0.0111]
Female	-0.003 [0.0090]	-0.007 [0.0093]	-0.007 [0.0094]	0.0152 [0.0223]	-0.003 [0.0086]	-0.008 [0.0093]	-0.007 [0.0088]	0.0152 [0.0220]
Number of young kids	0.0061 [0.0084]	0.0078 [0.0096]	0.0077 [0.0096]	0.0067 [0.0105]	0.0061 [0.0082]	0.0075 [0.0096]	0.0077 [0.0086]	0.0067 [0.0095]
Female X Number of young kids	-0.013 [0.0147]	-0.012 [0.0165]	-0.012 [0.0164]	-0.024 [0.0206]	-0.013 [0.0145]	-0.011 [0.0164]	-0.012 [0.0154]	-0.024 [0.0199]
Female X Single	0.0012 [0.0129]	0.0019 [0.0131]	0.0018 [0.0131]	-0.002 [0.0146]	0.0012 [0.0124]	0.0018 [0.0131]	0.0018 [0.0126]	-0.002 [0.0142]
Female X Single X Number of young kids	-0.030 [0.0295]	-0.034 [0.0262]	-0.034 [0.0261]	-0.011 [0.0354]	-0.030 [0.0293]	-0.031 [0.0263]	-0.034 [0.0282]	-0.011 [0.0363]
Region 1	-0.019 [0.0267]	-0.025 [0.0233]	-0.025 [0.0233]	0.0150 [0.0424]	-0.019 [0.0237]	-0.024 [0.0233]	-0.025 [0.0226]	0.0150 [0.0427]
Region 2, Antofagasta	0.0519*** [0.0183]	0.0627** [0.0245]	0.0626** [0.0245]	0.0773*** [0.0291]	0.0519*** [0.0173]	0.0635*** [0.0244]	0.0626*** [0.0194]	0.0773*** [0.0246]
Region 3	-0.005 [0.0234]	-0.006 [0.0243]	-0.006 [0.0242]	0.0128 [0.0322]	-0.005 [0.0240]	-0.006 [0.0243]	-0.006 [0.0245]	0.0128 [0.0312]
Region 4	-0.011 [0.0171]	-0.012 [0.0145]	-0.012 [0.0145]	0.0370 [0.0465]	-0.011 [0.0173]	-0.012 [0.0146]	-0.012 [0.0164]	0.0370 [0.0462]
Region 5	0.0035 [0.0114]	0.0041 [0.0112]	0.0040 [0.0113]	0.0435 [0.0362]	0.0035 [0.0108]	0.0036 [0.0112]	0.0040 [0.0108]	0.0435 [0.0358]
Region 6	-0.015 [0.0166]	-0.011 [0.0133]	-0.011 [0.0134]	0.0026 [0.0193]	-0.015 [0.0150]	-0.011 [0.0133]	-0.011 [0.0138]	0.0026 [0.0193]
Region 7	0.0143 [0.0145]	0.0170 [0.0135]	0.0171 [0.0134]	0.0637 [0.0424]	0.0143 [0.0139]	0.0169 [0.0134]	0.0171 [0.0134]	0.0637 [0.0424]
Region 8	0.0106 [0.0109]	0.0082 [0.0119]	0.0082 [0.0118]	0.0306 [0.0230]	0.0106 [0.0103]	0.0080 [0.0118]	0.0082 [0.0107]	0.0306 [0.0224]
Region 9	0.0023 [0.0166]	0.0039 [0.0143]	0.0039 [0.0143]	0.0349 [0.0316]	0.0023 [0.0165]	0.0041 [0.0143]	0.0039 [0.0156]	0.0349 [0.0314]
Region 10	0.0159 [0.0124]	0.0120 [0.0127]	0.0121 [0.0127]	0.0067 [0.0145]	0.0158 [0.0119]	0.0115 [0.0126]	0.0121 [0.0121]	0.0067 [0.0140]
Region 11	-0.016 [0.0504]	-0.026 [0.0437]	-0.025 [0.0435]	-0.024 [0.0489]	-0.028 [0.0428]	-0.028 [0.0427]	-0.025 [0.0401]	-0.024 [0.0438]
Region 12	0.0383 [0.0281]	0.0492 [0.0358]	0.0492 [0.0358]	0.0497 [0.0389]	0.0383 [0.0277]	0.0482 [0.0360]	0.0492 [0.0323]	0.0497 [0.0352]

(cont)

Table 5 (cont): The effect of temporary contracts on the probability of receiving employer-paid training

	Probit (Marginal effect)	LPM	LPM, 2SLS (edu)	LPM, 2SLS (edu, temp)	Probit, endog(edu), Marginal effect	LPM, RE	LPM, RE, 2SLS (edu)	LPM, RE, 2SLS (edu, temp)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Public sector employee	0.0063 [0.0107]	0.0052 [0.0125]	0.0048 [0.0128]	0.0120 [0.0146]	0.0064 [0.0106]	0.0048 [0.0124]	0.0048 [0.0110]	0.0120 [0.0135]
Firm size=1 employee	-0.293*** [0.0406]	-0.236*** [0.0135]	-0.236*** [0.0141]	-0.210*** [0.0282]	-0.293*** [0.0405]	-0.233*** [0.0135]	-0.236*** [0.0222]	-0.210*** [0.0325]
Firm size=2 to 9	-0.209*** [0.0113]	-0.222*** [0.0112]	-0.222*** [0.0116]	-0.215*** [0.0137]	-0.210*** [0.0114]	-0.219*** [0.0112]	-0.222*** [0.0108]	-0.215*** [0.0132]
Firm size=10 to 19	-0.146*** [0.0117]	-0.186*** [0.0127]	-0.185*** [0.0129]	-0.188*** [0.0140]	-0.146*** [0.0116]	-0.182*** [0.0116]	-0.185*** [0.0119]	-0.188*** [0.0132]
Firm size=20 to 49	-0.118*** [0.0099]	-0.165*** [0.0125]	-0.165*** [0.0125]	-0.156*** [0.0150]	-0.118*** [0.0097]	-0.163*** [0.0124]	-0.165*** [0.0107]	-0.156*** [0.0138]
Firm size=50 to 99	-0.109*** [0.0107]	-0.153*** [0.0134]	-0.153*** [0.0134]	-0.136*** [0.0204]	-0.109*** [0.0106]	-0.151*** [0.0133]	-0.153*** [0.0116]	-0.136*** [0.0193]
Firm size=100 to 199	-0.068*** [0.0113]	-0.113*** [0.0153]	-0.113*** [0.0153]	-0.102*** [0.0191]	-0.068*** [0.0112]	-0.112*** [0.0152]	-0.113*** [0.0128]	-0.102*** [0.0169]
Firm size=200 to 499	-0.040*** [0.0107]	-0.073*** [0.0160]	-0.073*** [0.0160]	-0.066*** [0.0180]	-0.040*** [0.0104]	-0.072*** [0.0159]	-0.073*** [0.0124]	-0.066*** [0.0149]
Agriculture, hunting, forestry, and fishing	-0.044*** [0.0167]	-0.017 [0.0124]	-0.016 [0.0142]	0.0867 [0.0894]	-0.044** [0.0176]	-0.019 [0.0123]	-0.016 [0.0155]	0.0867 [0.0899]
Mining	0.0526** [0.0236]	0.0720** [0.0350]	0.0725** [0.0350]	0.0900** [0.0415]	0.0524** [0.0229]	0.0720** [0.0349]	0.0725*** [0.0263]	0.0900*** [0.0324]
Manufacturing	-0.000 [0.0117]	-0.000 [0.0118]	-0.000 [0.0122]	-0.007 [0.0146]	-0.000 [0.0117]	-0.001 [0.0117]	-0.000 [0.0118]	-0.007 [0.0143]
Electricity, gas and water	0.0407 [0.0277]	0.0691* [0.0398]	0.0693* [0.0397]	0.0732* [0.0405]	0.0406 [0.0274]	0.0661* [0.0393]	0.0693** [0.0335]	0.0732** [0.0367]
Construction	-0.035** [0.0158]	-0.028** [0.0130]	-0.027** [0.0137]	0.1032 [0.1134]	-0.035** [0.0159]	-0.029** [0.0129]	-0.027* [0.0147]	0.1032 [0.1133]
Commerce, restaurants, and hotels	0.0020 [0.0112]	0.0016 [0.0108]	0.0020 [0.0109]	-0.009 [0.0155]	0.0019 [0.0110]	0.0007 [0.0108]	0.0020 [0.0110]	-0.009 [0.0154]
Transport, and communication	0.0145 [0.0135]	0.0151 [0.0149]	0.0155 [0.0150]	0.0191 [0.0163]	0.0144 [0.0132]	0.0134 [0.0148]	0.0155 [0.0138]	0.0191 [0.0154]
Financial Services, Real Estate, and Insurance	0.0286** [0.0123]	0.0373** [0.0147]	0.0373** [0.0147]	0.0302* [0.0165]	0.0286** [0.0119]	0.0363** [0.0147]	0.0373*** [0.0128]	0.0302** [0.0152]
year=2004	-0.001 [0.0074]	-0.002 [0.0077]	-0.002 [0.0077]	-0.003 [0.0084]	-0.001 [0.0075]	-0.002 [0.0077]	-0.002 [0.0078]	-0.003 [0.0085]
year=2006	-0.011 [0.0082]	-0.012 [0.0084]	-0.013 [0.0084]	-0.013 [0.0092]	-0.011 [0.0084]	-0.013 [0.0084]	-0.013 [0.0085]	-0.013 [0.0093]
year=2009	-0.079*** [0.0114]	-0.071*** [0.0090]	-0.071*** [0.0090]	-0.096*** [0.0240]	-0.079*** [0.0115]	-0.071*** [0.0090]	-0.071*** [0.0104]	-0.096*** [0.0243]
Constant	- [0.0400]	0.1303*** [0.0400]	0.1258*** [0.0475]	0.3428* [0.1942]	- [0.0399]	0.1288*** [0.0399]	0.1258*** [0.0472]	0.3428* [0.1925]
Number of observations	11790	11790	11790	11790	11790	11790	11790	11790
R-squared	0.10	0.10	0.10	-0.08		0.10	0.10	0.04
Specification Tests								
F test of excluded instruments (Education equation)			416.85	424.27			2385.98	2411.91
F test of excluded instruments (Temporary workers equation)			-	17.71			-	85.87
Hansen J statistic			4.865	2.801				
p-value of Hansen J statistic			0.182	0.2465				
Hausman Test: (Ho: The coefficient of temp by 2SLS (edu) is equal to the coeff of temp by 2SLS (edu, temp))								
Hausman Test Statistic (robust to heteroskedasticity, bootstrap)				0.857				0.863
p-value of Hausman Test Statistic				0.355				0.353

Note: (1) Robust standard errors, clustered by worker. (2) *** p<0.01, ** p<0.05, * p<0.1.

Table 6: The effect of temporary contracts on the probability of receiving training

	Probit (Marginal effect)	LPM	LPM, 2SLS (edu)	LPM, 2SLS (edu, temp)	Probit, endog(edu), Marginal effect	LPM, RE	LPM, RE, 2SLS (edu)	LPM, RE, 2SLS (edu, temp)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Temporary employee	-0.051*** [0.0120]	-0.042*** [0.0098]	-0.040*** [0.0102]	-0.335 [0.4164]	-0.049*** [0.0122]	-0.041*** [0.0098]	-0.040*** [0.0112]	-0.335 [0.4161]
Years of education	0.0193*** [0.0012]	0.0186*** [0.0012]	0.0204*** [0.0026]	0.0144 [0.0089]	0.0208*** [0.0025]	0.0186*** [0.0012]	0.0204*** [0.0025]	0.0144 [0.0088]
Age/100	0.3299 [0.2386]	0.3252 [0.2103]	0.3123 [0.2109]	0.1307 [0.3398]	0.3168 [0.2250]	0.2999 [0.2087]	0.3123 [0.2107]	0.1307 [0.3359]
Age/100 squared	-0.490* [0.2844]	-0.414* [0.2403]	-0.384 [0.2435]	-0.292 [0.2872]	-0.460* [0.2697]	-0.386 [0.2382]	-0.384 [0.2460]	-0.292 [0.2850]
Married	0.0130 [0.0100]	0.0126 [0.0097]	0.0125 [0.0097]	0.0069 [0.0126]	0.0129 [0.0093]	0.0115 [0.0096]	0.0125 [0.0093]	0.0069 [0.0123]
Female	0.0140 [0.0106]	0.0131 [0.0112]	0.0120 [0.0113]	0.0275 [0.0248]	0.0130 [0.0100]	0.0120 [0.0111]	0.0120 [0.0104]	0.0275 [0.0243]
Number of young kids	-0.002 [0.0102]	-0.002 [0.0105]	-0.002 [0.0105]	-0.003 [0.0109]	-0.003 [0.0099]	-0.003 [0.0105]	-0.002 [0.0101]	-0.003 [0.0105]
Female X Number of young kids	-0.010 [0.0173]	-0.007 [0.0194]	-0.007 [0.0194]	-0.015 [0.0234]	-0.009 [0.0171]	-0.005 [0.0194]	-0.007 [0.0181]	-0.015 [0.0220]
Female X Single	0.0007 [0.0152]	0.0021 [0.0161]	0.0014 [0.0161]	-0.001 [0.0170]	0.0001 [0.0142]	0.0019 [0.0160]	0.0014 [0.0148]	-0.001 [0.0157]
Female X Single X Number of young kids	-0.078** [0.0341]	-0.075** [0.0303]	-0.075** [0.0302]	-0.060 [0.0384]	-0.077** [0.0341]	-0.072** [0.0305]	-0.075** [0.0331]	-0.060 [0.0401]
Region 1	0.0107 [0.0298]	0.0037 [0.0298]	0.0022 [0.0298]	0.0295 [0.0477]	0.0094 [0.0265]	0.0066 [0.0297]	0.0022 [0.0265]	0.0295 [0.0472]
Region 2, Antofagasta	0.0482** [0.0230]	0.0533** [0.0269]	0.0528** [0.0269]	0.0627** [0.0313]	0.0478** [0.0211]	0.0562** [0.0268]	0.0528** [0.0227]	0.0627** [0.0272]
Region 3	0.0116 [0.0292]	0.0133 [0.0298]	0.0139 [0.0297]	0.0266 [0.0344]	0.0123 [0.0279]	0.0147 [0.0297]	0.0139 [0.0287]	0.0266 [0.0345]
Region 4	0.0105 [0.0199]	0.0068 [0.0183]	0.0065 [0.0183]	0.0399 [0.0513]	0.0103 [0.0196]	0.0092 [0.0183]	0.0065 [0.0192]	0.0399 [0.0511]
Region 5	0.0145 [0.0135]	0.0145 [0.0134]	0.0137 [0.0134]	0.0402 [0.0402]	0.0138 [0.0126]	0.0144 [0.0133]	0.0137 [0.0126]	0.0402 [0.0396]
Region 6	0.0024 [0.0181]	0.0040 [0.0152]	0.0052 [0.0153]	0.0146 [0.0207]	0.0035 [0.0175]	0.0036 [0.0152]	0.0052 [0.0162]	0.0146 [0.0213]
Region 7	0.0329* [0.0169]	0.0394** [0.0161]	0.0402** [0.0160]	0.0714 [0.0471]	0.0336** [0.0161]	0.0407** [0.0161]	0.0402** [0.0157]	0.0714 [0.0469]
Region 8	0.0265** [0.0127]	0.0266** [0.0135]	0.0265** [0.0135]	0.0415 [0.0253]	0.0264** [0.0122]	0.0268** [0.0134]	0.0265** [0.0125]	0.0415* [0.0247]
Region 9	0.0264 [0.0190]	0.0296 [0.0182]	0.0300* [0.0182]	0.0507 [0.0352]	0.0266 [0.0183]	0.0315* [0.0182]	0.0300 [0.0182]	0.0507 [0.0348]
Region 10	0.0671*** [0.0146]	0.0656*** [0.0158]	0.0665*** [0.0158]	0.0628*** [0.0173]	0.0678*** [0.0134]	0.0636*** [0.0157]	0.0665*** [0.0141]	0.0628*** [0.0155]
Region 11	0.0873* [0.0451]	0.0814 [0.0530]	0.0828 [0.0529]	0.0835 [0.0546]	0.0887* [0.0458]	0.0772 [0.0529]	0.0828* [0.0470]	0.0835* [0.0485]
Region 12	0.0398 [0.0360]	0.0398 [0.0398]	0.0397 [0.0398]	0.0401 [0.0400]	0.0397 [0.0362]	0.0371 [0.0401]	0.0397 [0.0378]	0.0401 [0.0389]

(cont)

Table 6 (cont): The effect of temporary contracts on the probability of receiving training

	Probit (Marginal effect)	LPM	LPM, 2SLS (edu)	LPM, 2SLS (edu, temp)	Probit, endog(edu), Marginal effect	LPM, RE	LPM, RE, 2SLS (edu)	LPM, RE, 2SLS (edu, temp)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Public sector employee	0.0562*** [0.0122]	0.0746*** [0.0149]	0.0725*** [0.0151]	0.0773*** [0.0167]	0.0543*** [0.0120]	0.0730*** [0.0148]	0.0725*** [0.0129]	0.0773*** [0.0149]
Firm size=1 employee	-0.286*** [0.0320]	-0.265*** [0.0183]	-0.261*** [0.0189]	-0.244*** [0.0314]	-0.283*** [0.0325]	-0.260*** [0.0182]	-0.261*** [0.0260]	-0.244*** [0.0360]
Firm size=2 to 9	-0.232*** [0.0124]	-0.242*** [0.0128]	-0.239*** [0.0132]	-0.234*** [0.0152]	-0.229*** [0.0126]	-0.236*** [0.0128]	-0.239*** [0.0126]	-0.234*** [0.0146]
Firm size=10 to 19	-0.164*** [0.0138]	-0.193*** [0.0148]	-0.191*** [0.0150]	-0.193*** [0.0156]	-0.162*** [0.0135]	-0.188*** [0.0146]	-0.191*** [0.0140]	-0.193*** [0.0146]
Firm size=20 to 49	-0.119*** [0.0117]	-0.153*** [0.0141]	-0.152*** [0.0142]	-0.147*** [0.0165]	-0.118*** [0.0116]	-0.151*** [0.0140]	-0.152*** [0.0126]	-0.147*** [0.0153]
Firm size=50 to 99	-0.097*** [0.0126]	-0.128*** [0.0154]	-0.127*** [0.0154]	-0.116*** [0.0204]	-0.096*** [0.0225]	-0.126*** [0.0152]	-0.127*** [0.0136]	-0.116*** [0.0214]
Firm size=100 to 199	-0.081*** [0.0141]	-0.116*** [0.0170]	-0.116*** [0.0170]	-0.108*** [0.0204]	-0.080*** [0.0138]	-0.116*** [0.0168]	-0.116*** [0.0150]	-0.108*** [0.0186]
Firm size=200 to 499	-0.050*** [0.0136]	-0.078*** [0.0174]	-0.078*** [0.0174]	-0.073*** [0.0191]	-0.050*** [0.0131]	-0.078*** [0.0172]	-0.078*** [0.0146]	-0.073*** [0.0165]
Agriculture, hunting, forestry, and fishing	-0.080*** [0.0188]	-0.052*** [0.0152]	-0.045*** [0.0173]	0.0235 [0.0992]	-0.074*** [0.0198]	-0.054*** [0.0150]	-0.045*** [0.0182]	0.0235 [0.0995]
Mining	0.0097 [0.0293]	0.0065 [0.0362]	0.0087 [0.0362]	0.0205 [0.0418]	0.0116 [0.0288]	0.0057 [0.0359]	0.0087 [0.0308]	0.0205 [0.0358]
Manufacturing	-0.030** [0.0137]	-0.035** [0.0139]	-0.032** [0.0145]	-0.037** [0.0164]	-0.027** [0.0136]	-0.036*** [0.0138]	-0.032** [0.0138]	-0.037** [0.0158]
Electricity, gas and water	0.0063 [0.0372]	0.0113 [0.0442]	0.0124 [0.0441]	0.0150 [0.0437]	0.0073 [0.0361]	0.0016 [0.0431]	0.0124 [0.0392]	0.0150 [0.0406]
Construction	-0.062*** [0.0179]	-0.058*** [0.0158]	-0.054*** [0.0167]	0.0331 [0.1255]	-0.058*** [0.0181]	-0.058*** [0.0158]	-0.054*** [0.0172]	0.0331 [0.1253]
Commerce, restaurants, and hotels	-0.029** [0.0128]	-0.035*** [0.0128]	-0.033*** [0.0131]	-0.041** [0.0173]	-0.027** [0.0126]	-0.036*** [0.0127]	-0.033*** [0.0129]	-0.041** [0.0170]
Transport, and communication	-0.002 [0.0164]	-0.006 [0.0177]	-0.004 [0.0178]	-0.002 [0.0186]	-0.000 [0.0155]	-0.009 [0.0174]	-0.004 [0.0162]	-0.002 [0.0170]
Financial Services, Real Estate, and Insurance	-0.006 [0.0146]	-0.007 [0.0167]	-0.007 [0.0167]	-0.012 [0.0182]	-0.006 [0.0139]	-0.006 [0.0166]	-0.007 [0.0150]	-0.012 [0.0168]
year=2004	-0.008 [0.0085]	-0.011 [0.0089]	-0.011 [0.0089]	-0.012 [0.0091]	-0.008 [0.0088]	-0.011 [0.0089]	-0.011 [0.0091]	-0.012 [0.0094]
year=2006	-0.024** [0.0095]	-0.028*** [0.0099]	-0.028*** [0.0099]	-0.029*** [0.0102]	-0.025** [0.0098]	-0.029*** [0.0098]	-0.028*** [0.0100]	-0.029*** [0.0103]
year=2009	-0.153*** [0.0136]	-0.140*** [0.0107]	-0.141*** [0.0108]	-0.157*** [0.0262]	-0.153*** [0.0135]	-0.140*** [0.0107]	-0.141*** [0.0122]	-0.157*** [0.0269]
Constant	- [0.0136]	0.1057** [0.0478]	0.0820 [0.0560]	0.2274 [0.2145]	- [0.0135]	0.1090** [0.0476]	0.0820 [0.0553]	0.2274 [0.2130]
Number of observations	11790	11790	11790	11790	11790	11790	11790	11790
R-squared		0.13	0.13	0.08		0.1648	0.1642	0.1244
Specification Tests								
F test of excluded instruments (Education equation)			416.85	424.27			2385.98	2411.91
F test of excluded instruments (Temporary workers equation)				17.71			-	85.87
Hansen J statistic			1.819	0.961				
p-value of Hansen J statistic			0.6107	0.6184				
Hausman Test: Ho: The coefficient of temp by 2SLS (edu) is equal to the coeff of temp by 2SLS (edu, temp)								
Hausman Test Statistic (robust to heteroskedasticity, bootstrap)				0.385				0.751
p-value of Hausman Test Statistic				0.535				0.386

Note: (1) Robust standard errors, clustered by worker. (2) *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Labor market transitions

	Permanent	Temporal	Self employed or Employer	Unemployed	Inactive	Exit sample	Total
(a) Transition between consecutive waves of the survey							
2002 to 2004							
Permanent	56.09	4.43	4.97	4.93	4.80	24.78	100
Temporal	31.22	24.52	8.14	10.95	7.78	17.38	100
Self employed or Employer	10.79	4.47	42.84	6.66	12.25	22.99	100
Unemployed	22.45	14.55	9.36	21.27	13.36	19.00	100
Inactive	5.56	5.13	4.31	7.97	52.86	24.16	100
New in sample	3.98	1.68	4.62	2.79	15.27	-	100
2004 to 2006							
Permanent	61.83	5.79	7.26	5.90	4.29	14.94	100
Temporal	25.65	28.09	8.96	14.87	10.09	12.35	100
Self employed or Employer	12.32	4.95	47.78	7.83	12.78	14.34	100
Unemployed	17.49	12.07	10.62	19.87	26.37	13.58	100
Inactive	5.80	3.71	4.74	10.32	59.87	15.57	100
New in sample	4.71	0.53	1.72	0.82	2.31	-	100
2006 to 2009							
Permanent	54.06	3.58	5.56	5.45	4.56	26.80	100
Temporal	29.67	18.41	9.34	13.92	11.72	16.94	100
Self employed or Employer	15.99	3.54	40.13	6.17	12.80	21.36	100
Unemployed	16.06	7.51	9.92	14.13	31.08	21.30	100
Inactive	4.61	1.99	4.69	7.86	59.14	21.71	100
New in sample	3.13	0.66	1.16	0.93	2.29	-	100
(b) Transition between non consecutive waves of the survey							
2002 to 2006							
Permanent	52.69	4.40	7.32	5.41	6.11	24.08	100
Temporal	30.95	20.45	10.50	9.95	8.60	19.55	100
Self employed or Employer	12.02	5.59	39.32	6.32	14.09	22.65	100
Unemployed	27.45	13.36	10.00	15.27	13.91	20.00	100
Inactive	6.72	3.74	4.42	9.87	46.45	28.79	100
New in sample	4.15	1.91	3.81	3.23	11.58	-	100
2004 to 2009							
Permanent	49.36	3.72	5.74	5.61	6.31	29.26	100
Temporal	26.52	15.39	7.48	13.91	13.22	23.48	100
Self employed or Employer	11.16	3.84	38.28	6.21	14.70	25.81	100
Unemployed	18.06	7.59	10.19	13.80	24.64	25.72	100
Inactive	7.40	2.33	4.37	6.92	50.87	28.12	100
New in sample	3.94	0.54	1.32	0.83	2.16	-	100

Table A1: Consistency criteria used to construct a panel of workers

	2002	2004	2006	2009	Total
Consistent	5,019 79.4%	3,085 76.7%	2,340 77.4%	1,420 71.6%	11,864 77.3%
Inconsistent: Gender	46 0.7%	31 0.8%	23 0.8%	11 0.6%	111 0.7%
Inconsistent: Age	1,253 19.8%	908 22.6%	662 21.9%	552 27.8%	3,375 22.0%
Total	6,318	4,024	3,025	1,983	15,350

Table A2: Structure of the panel

Observations	Workers		Observations	
	Number	Percentage	Number	Percentage
1	2,788	44.4%	2,788	23.5%
2	1,873	29.9%	3,746	31.6%
3	1,120	17.9%	3,360	28.3%
4	493	7.9%	1,972	16.6%
Total	6,274	100.0%	11,866	100.0%

Table A3: First-stage regressions

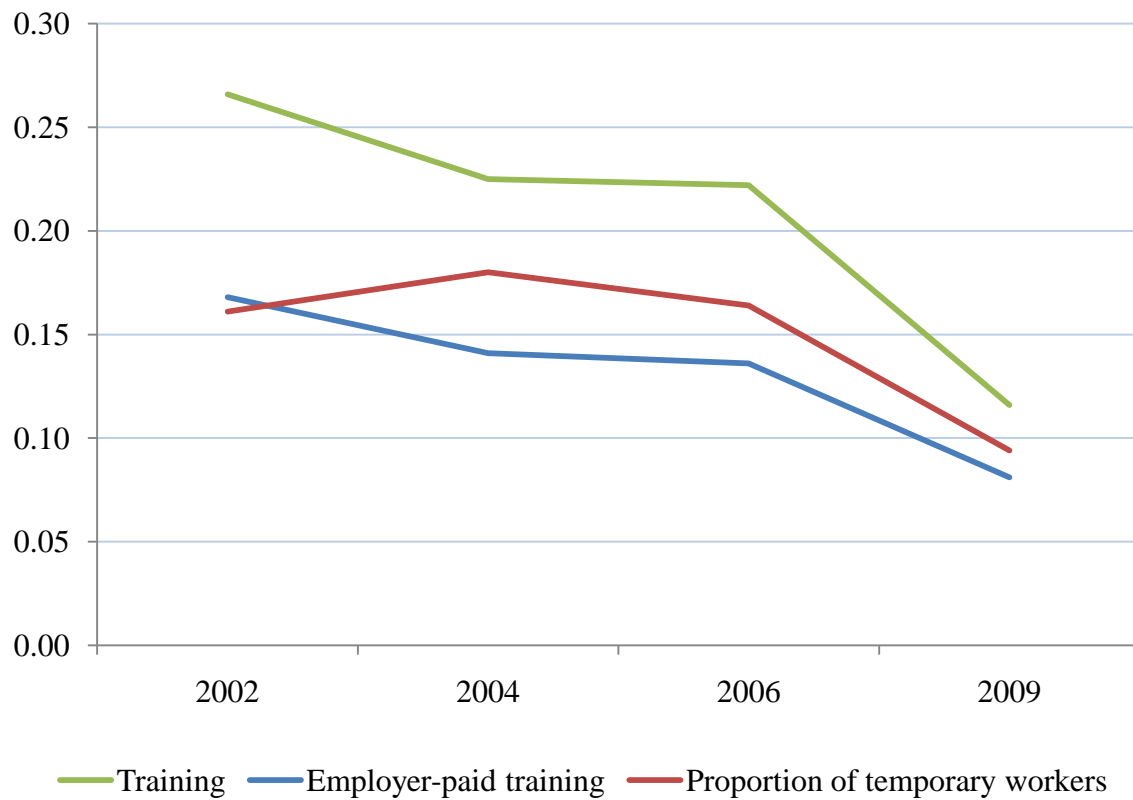
	Model Col. (3)	Model Col. (4)	Model Col. (5)	Model Col. (7)	Model Col. (8)
	Dep. Var.: Education	Dep. Var.: Education	Dep. Var.: Temporary	Dep. Var.: Education	Dep. Var.: Temporary
Temporary employee	-0.838*** [0.0864]	-	-	-0.838*** [0.0778]	-
Age/100	13.108*** [1.9214]	13.866*** [1.9235]	-0.904*** [0.2067]	13.108*** [1.4967]	13.866*** [1.4459]
Age/100 squared	-20.73*** [2.3628]	-21.37*** [2.3632]	0.7591*** [0.2347]	-20.73*** [1.8244]	-21.37*** [1.6605]
Married	0.0867 [0.0785]	0.1042 [0.0791]	-0.020** [0.0088]	0.0867 [0.0633]	0.1042 [0.0639]
Female	0.2085** [0.1000]	0.1668* [0.1008]	0.0498*** [0.0094]	0.2085*** [0.0734]	0.1668** [0.0709]
Number of young kids	0.0488 [0.0780]	0.0515 [0.0789]	-0.003 [0.0091]	0.0488 [0.0672]	0.0515 [0.0698]
Female X Single	0.3349*** [0.1275]	0.3486*** [0.1282]	-0.016 [0.0135]	0.3349*** [0.0986]	0.3486*** [0.1010]
Female X Number of young kids	-0.044 [0.1302]	-0.020 [0.1311]	-0.028* [0.0148]	-0.044 [0.1128]	-0.020 [0.1237]
Female X Single X Number of young kids	-0.208 [0.2042]	-0.254 [0.2034]	0.0553* [0.0302]	-0.208 [0.1856]	-0.254 [0.2265]
Region 1	0.4370** [0.2147]	0.3650* [0.2159]	0.0859*** [0.0272]	0.4370*** [0.1657]	0.3650** [0.1810]
Region 2	-0.055 [0.2044]	-0.085 [0.2050]	0.0352* [0.0193]	-0.055 [0.1481]	-0.085 [0.1556]
Region 3	-0.195 [0.2777]	-0.234 [0.2793]	0.0470* [0.0286]	-0.195 [0.2116]	-0.234 [0.1964]
Region 4	-0.158 [0.1531]	-0.258* [0.1535]	0.1190*** [0.0213]	-0.159 [0.1173]	-0.258** [0.1318]
Region 5	0.2550** [0.1188]	0.1816 [0.1187]	0.0876*** [0.0133]	0.2550*** [0.0871]	0.1816** [0.0866]
Region 6	-0.457*** [0.1711]	-0.494*** [0.1727]	0.0439** [0.0187]	-0.457*** [0.1137]	-0.494*** [0.1106]
Region 7	-0.068 [0.1582]	-0.160 [0.1597]	0.1091*** [0.0185]	-0.068 [0.1110]	-0.160 [0.1077]
Region 8	0.1588 [0.1202]	0.1166 [0.1209]	0.0504*** [0.0120]	0.1588* [0.0851]	0.1166 [0.0860]
Region 9	0.0025 [0.1765]	-0.057 [0.1800]	0.0719*** [0.0187]	0.0025 [0.1231]	-0.057 [0.1251]
Region 10	-0.358** [0.1419]	-0.356** [0.1431]	-0.002 [0.0136]	-0.358*** [0.1008]	-0.356*** [0.0972]
Region 11	-0.486 [0.3359]	-0.501 [0.3475]	0.0173 [0.0470]	-0.486 [0.2965]	-0.501 [0.3220]
Region 12	0.0141 [0.2986]	0.0091 [0.3083]	0.0059 [0.0323]	0.0139 [0.2362]	0.0091 [0.2591]

(cont)

Table A3 (cont): First-stage regressions

	Model Col. (3)	Model Col. (4)	Model Col. (5)	Model Col. (7)	Model Col. (8)
	Dep. Var.: Education	Dep. Var.: Education	Dep. Var.: Temporary	Dep. Var.: Education	Dep. Var.: Temporary
Public sector employee	0.9806*** [0.1234]	0.9836*** [0.1243]	-0.003 [0.0102]	0.9806*** [0.0987]	0.9836*** [0.0866]
Firm size=1 employee	-1.376*** [0.2195]	-1.450*** [0.2201]	0.0872*** [0.0256]	-1.376*** [0.1893]	-1.450*** [0.1746]
Firm size=2 to 9	-1.136*** [0.0957]	-1.170*** [0.0963]	0.0397*** [0.0103]	-1.136*** [0.0801]	-1.170*** [0.0826]
Firm size=10 to 19	-0.885*** [0.1022]	-0.895*** [0.1026]	0.0121 [0.0116]	-0.885*** [0.0918]	-0.895*** [0.0940]
Firm size=20 to 49	-0.427*** [0.0986]	-0.451*** [0.0991]	0.0287*** [0.0102]	-0.427*** [0.0865]	-0.451*** [0.0858]
Firm size=50 to 99	-0.246** [0.1093]	-0.283*** [0.1096]	0.0446*** [0.0111]	-0.246*** [0.0937]	-0.283*** [0.0933]
Firm size=100 to 199	-0.325*** [0.1143]	-0.352*** [0.1149]	0.0318** [0.0125]	-0.325*** [0.1014]	-0.352*** [0.1022]
Firm size=200 to 499	-0.141 [0.1073]	-0.157 [0.1082]	0.0190 [0.0116]	-0.141 [0.0977]	-0.157 [0.0999]
Agriculture, hunting, forestry, and fishing	-2.580*** [0.1508]	-2.824*** [0.1493]	0.2913*** [0.0184]	-2.580*** [0.1169]	-2.824*** [0.1086]
Mining	-1.288*** [0.2848]	-1.344*** [0.2870]	0.0671** [0.0289]	-1.288*** [0.2219]	-1.344*** [0.2098]
Manufacturing	-1.201*** [0.1175]	-1.207*** [0.1175]	0.0076 [0.0103]	-1.201*** [0.0933]	-1.201*** [0.0909]
Electricity, gas and water	-0.560 [0.3505]	-0.577 [0.3535]	0.0202 [0.0296]	-0.560** [0.2839]	-0.577** [0.2682]
Construction	-1.743*** [0.1479]	-2.027*** [0.1460]	0.3389*** [0.0185]	-1.743*** [0.1191]	-2.027*** [0.1115]
Commerce, restaurants, and hotels	-1.025*** [0.1072]	-1.021*** [0.1078]	-0.004 [0.0099]	-1.025*** [0.0855]	-1.025*** [0.0857]
Transport, and communication	-1.000*** [0.1366]	-1.025*** [0.1372]	0.0298** [0.0132]	-1.000*** [0.1082]	-1.000*** [0.1092]
Financial Services, Real Estate, and Insurance	-0.069 [0.1214]	-0.056 [0.1212]	-0.015 [0.0105]	-0.069 [0.0996]	-0.056 [0.1025]
year=2004	0.2215*** [0.0485]	0.2268*** [0.0487]	-0.006 [0.0072]	0.2215*** [0.0628]	0.2268*** [0.0623]
year=2006	0.2952*** [0.0576]	0.3015*** [0.0579]	-0.007 [0.0083]	0.2952*** [0.0691]	0.2952*** [0.0684]
year=2009	0.3565*** [0.0708]	0.4116*** [0.0709]	-0.065*** [0.0088]	0.3565*** [0.0821]	0.3565*** [0.0835]
Excluded instruments:					
Mother education (number of years)	0.2396*** [0.0091]	0.2429*** [0.0092]	-0.003*** [0.0009]	0.2395*** [0.0066]	0.2396*** [0.0067]
Repeated a course in basic education	-1.014*** [0.0532]	-1.029*** [0.0535]	0.0185*** [0.0058]	-1.014*** [0.0380]	-1.029*** [0.0364]
Grew in an indigent household	-1.386*** [0.2434]	-1.449*** [0.2432]	0.0755*** [0.0269]	-1.389*** [0.1706]	-1.449*** [0.1532]
Grew in a poor household	-0.903*** [0.0819]	-0.929*** [0.0826]	0.0318*** [0.0082]	-0.903*** [0.0577]	-0.929*** [0.0565]
Constant	10.224*** [0.3923]	9.9915*** [0.3926]	0.2783*** [0.0446]	10.225*** [0.3071]	10.224*** [0.3115]
Number of observations	11790	11790	11790	11790	11790
R-squared	0.45	0.45	0.17		
F test of excluded instruments	416.85	424.27	17.71		

Figure 1: Evolution of Training and Temporary Work in Chile, 2002-2009



Source: Authors' calculations using Social Protection Surveys.