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ORIGINAL ARTICLE

Empirically Examining the Individual-Level Determinants of Job Searching Outcomes: a Non-linear Analysis under the Case of Chile

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Abstract

This paper empirically examines the determinants that can help job searchers successfully find jobs. We acquire individual-level data from the 2009 National Employment Survey of Chile and use an innovative non-linear estimation which examines the influences of two individual-level factors: job searchers' searching efforts and their previous work experience. It is found that whether one searcher is actively searching and whether the searcher has been employed before both significantly affect the job searching outcomes. To be specific, actively searching for jobs with resumes and social networks as well as public assistance provides more opportunities to successfully find a job. Similar consequences may occur for someone without previous work experience. Furthermore, the disparities in the job searching results are also affected by multiple individual characteristics, such as age, gender, and education level. For example, active searching only significantly helps men but not women and those people with average instead of higher education backgrounds find jobs, while previous work experience can help women or those who receive higher education find jobs more easily. Relevant policy implications are also discussed.

Keywords Job searching · Active searching · Previous working experience · Education · Gender · Age

JEL Classification C13 · J10 · J64

Introduction

Job searching methods, as well as the searching outcomes, are often the focus of economic studies. On the one hand, searching motivation and intensity both play important roles in findings jobs. On the other hand, individual characteristics such as age, gender, and education also have a significant effect; Kiefer and Neumann (1981) find that individual heterogeneity explains over 90% of the wage variation in the population while searching methods only explain 8.7%. What factors can help people successfully find jobs? What kind of roles do individual characteristics play during the job searching process? These are the questions we intend to address in this paper.

Using an individual-level dataset from Chile for the year 2009, this paper investigates the factors that will help one find a job successfully. We study multiple factors. The first one is one's job searching efforts, such as whether a person frequently sends resumes and uses social network or public assistance. We also study the effects of previous working experience, as well as how individual heterogeneity affects the job searching outcome in different ways.

We acquired data from 2009 National Employment Survey conducted by National Statistics Institute of Chile. This is a cross-sectional dataset with individual information on people's personal information such as age, gender, education level, marital status, and their job market experience. This is a unique dataset with massive observations and suits the purpose of our study perfectly. Furthermore, Chile makes an interesting object because it figures unique economic meaning. Starting from the 1980s, Chile has achieved impressive economic growth after a series of economic reforms. From the

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1980s to 2000, Chilean economy was greatly liberalized, with an average annual GDP (Gross Domestic Product) growth rate at 4.7% and an average annual GDP per capita growth at 3.1%. These numbers rose further to 5.0 and 3.8%, respectively, between 2001 and 2007,[1] when the great recession struck the economy. These achievements helped Chile become the most prosperous country in South America, and in 2010, it became the first South American country to join OECD (the Organization for Economic Co-operation and Development), whose members are representative high-income countries all over the world.

In spite of Chile's fast economic growth, its unemployment rate has been hovering at a high level. According to World Bank's information, between 2001 and 2007, while its economic development made significant progress, its average annual unemployment rate was 9.6%, which is significantly higher than 6.1%, the average level across the OECD members.[2] Therefore, it is particularly interesting to look into Chile's labor market and how Chilean people behave on job searching. Getting a good understanding of the factors that might help or hinder one's job searching outcome will also provide important policy implications, helping facilitate the searching process and effectively decreasing unemployment rate.

We begin by estimating and decomposing the individual-level probabilities of people successfully finding jobs. We innovatively build a non-linear estimation model which compares the effects of various statuses: first, whether one is actively searching for jobs or not; second, whether one has previous work experience or not. Jointly conducting the tests on both probabilities, we examine the influence of people's job searching efforts and previous experience, as well as other individual characteristics, such as age, gender, and education.

The findings are significant, yet different, across job searchers with various characteristics. Generally speaking, one is more easily able to find jobs after actively searching with personal social networks, as well as with public assistance. This positive influence from active searching works more significantly on males, or on those searchers who are older than thirty years of age, or on those with only an average education background. Interesting enough, overall, we also find that no previous experience brings more likelihood of finding jobs relative to with previous employment history. However, this positive influence of never being employed before only works for male job searchers, or those below thirty years old, or those with only average education level. For female searchers, mature workers, or those with a higher education background, having previous work experience helps them to find jobs more easily. These interesting and mixed findings reveal significant insights into the job searching process.

The main contribution of this paper is our method. In order to examine the influences of different statuses, we compare the job-finding probability between different searching statuses; we estimate the ratio between the job-finding probability if a searcher actively searches and the probability if a searcher does not actively search. Similarly, we also compare the job-finding probability between different previous working experiences; we estimate the ratio between the job-finding probability if a searcher has previous working experience and the probability if a searcher does not have such experience. In other words, we estimate the ratios between probabilities, not the probabilities themselves. We do this for a specific purpose. In the existing literatures, people have been studying the impacts of, for example, searching activeness on job searching outcomes directly by using traditional linear or non-linear estimations. They can show whether or how much actively searching for jobs can help a person find jobs eventually, but they cannot show the difference between being an active searcher or otherwise. On the contrary, our estimation results can detect whether actively searching (or having previous working experience) can statistically significantly help to find jobs relative to not actively searching (or not having previous working experience). In this way, we can effectively and innovatively highlight the impact of searching manners and previous experience during job searching processes.

This paper also makes a unique contribution by innovatively examining the effects of different job searching determinants. We intend to keep aligned with the existing literature in regard to the choice of the determinants, which include people's searching efforts and previous work experience. The existing literature has reached controversial conclusions upon these determinants. For example, the specific searching method is a determinant where mixed findings have been achieved. Fougère et al. (2005) find that the public employment service effectively helps matching job vacancies and job seekers in France. Using data from the Netherlands, Gorter and Kalb (1996) find that the job search assistance program helps the unemployed reduce the time needed for finding jobs. However, Ashenfelter et al. (2005) find that intensive searching does not significantly help finding jobs. Meanwhile, intensive job searching, including using one's social networks, is found to be either over-utilized (Cahuc and Fontaine 2009) or insufficient (Marimon and Zilibotti 1999; Acemoglu and Shimer 1999, 2000). In our study, we reconcile these conflicts by considering the influence of personal characteristics, such as age, gender, and education background.

The remainder of this paper is organized as follows. "Literature Review" presents review of different studies. Estimation method used in the study was explained in "Methodology". "Data Description" describes the data.

[1] Date source: World Bank, https://data.worldbank.org/country/chile.

[2] Data source: OECD, https://data.oecd.org/unemp/unemployment-rate.htm.

Estimation results and findings is presented in "Estimation Results". "Discussion and Policy Implications" provides policy implications, and concluding statements of the paper is presented in "Conclusion".

Literature Review

Job searching methods, as well as results, are often the focus of economic studies. Some focus on job searching models. A traditional job searching model was introduced by McCall (1970) and Mortenson (1970), where a rational worker calculates a personal reservation wage in order to maximize his or her wealth. The worker will then only accept a job if the offered wage exceeds the reservation wage. Based on this theorem, multiple extensions have been made. Kiefer and Neumann (1979) study the variation of people's reservation and find that it declines significantly over the duration of unemployment. The same authors (Kiefer and Neumann 1981) also bring individual heterogeneity into wage offer distribution later. Bontemps et al. (1999) allow on-the-job search within the searching model, while Jolivet et al. (2006) study individual wage dynamics and job-to-job turnover. Moreover, Mortensen and Pissarides (1994) establish an equilibrium search model of unemployment, which studies job destruction and job creation processes and the matching dynamics common to both. Following their theory, multiple extensions have been made (Mortensen and Pissarides 1999a, b; Pissarides 2000; Shimer 2005, 2012).

In the literature, there are many studies of the empirical determinants of job searching. Part of this literature focuses on search efforts. Some studies use search time as an approximation for the search effort (Barron and Mellow 1979). Some measure the search effort by the number of employer contacts (Kahn and Low 1990). Others use the number of search methods (Holzer 1988). In this paper, we will measure search effort—in other words, actively searching—by search channels: updating resumes, using public employment assistance, and social networks.

Updating resumes is the most common way for people to find jobs, and it is traditionally considered as a typical way to actively search (Shimer, 2004; Faberman et al. 2017). The effect of using public employment service on job finding has also been heavily studied. Gregg and Wadsworth (1996) report that the public employment office plays an important role in job finding (70% of unemployed job seekers) in Great Britain. Labini (2005) also presents an empirical analysis of the job search process. Their results show that public employment service is an important determinant of job finding success in Italy.

Weber and Mahringer (2008) study the effect of the choice of search effort and search methods on job search success and match quality. Using data from a survey of 500 successful job searchers in Austria, they find that the public employment service is as efficient as other methods for more poorly qualified workers. However, some studies have reached very different conclusions. Holzer (1988) shows that the effect of the public employment office on job finding is limited within the US. Addison and Portugal (2002) use data from the quarterly Labour Force Survey of the Portuguese National Institute of Statistics to examine the effect of search methods on job search success and earnings. The results show that the public employment service is inefficient in Portugal.

Many studies also examine the effect of social networks on job finding outcomes. Granovetter (1995) studies the impact of social networks on job search success and finds that a social network is a useful search method. Labini (2005) finds that the social network is an important determinant of job finding success. Zhang et al. (2010) suggest that the social network has a positive effect on job search and career achievement in China. Schulze-Ehlers (2015) also shows that the social network has a significant negative effect on job search outcome, but only for female graduates. Meanwhile, Schöer and Leibbrandt (2006) focus on determinants of job search strategies of the unemployed in South Africa. They use the data of 1176 households on labor market activities and individual characteristics from Cape Town to study determinants of job search strategies. Their results also suggest that the social network is an important factor of job finding.

Besides studying the influence of job searching efforts, the literature also suggests that past employment experience may be important for job search success. But, as Kanfer et al. (2001) point out, there is a lack of studies investigating the effect of employment history on job finding. Only a handful of studies have considered the role of employment history in influencing job finding. Labini (2005) finds that previous employment experience has a positive effect on job search success in Italy.

Longhi and Taylor (2010) argue that differences between employed and unemployed job seekers are possibly due to their different work histories or other unobserved heterogeneity. The main purpose of their paper is to investigate the differences in employment experience between employed and unemployed job seekers. They use data from the British Household Panel Survey (BHPS) form 1993 to 2007 to compare employment histories of employed and unemployed people and find important differences in past employment and job histories between employed and unemployed job seekers.

However, using data from a nationwide survey of 305 graduates of agricultural sciences in Germany, Schulze-Ehlers (2015) studies the factors that determine the job search success of these graduates. She shows that the effect of practical experience on job search success is ambiguous. Self-assessed practical and international experience has a positive effect on salary, but not on search duration, and there is no significant relationship between internship and job search success.

In a more recent paper, Faberman et al. (2017) shed additional light on this issue. They use the Survey of Consumer Expectations (SCE) of roughly 1300 individuals from 2013 to 2015 from the Federal Reserve Bank of New York to investigate the effect of search effort on the search outcome for employed and non-employed job seekers. Their results indicate that employment status has an important effect on job search success. They allow the unobserved heterogeneity of workers into their model to account for the wage offer differential between the employed and the non-employed and show that the work history of a worker provides helpful guidance in addressing the unobserved heterogeneity.

Methodology

We implement innovative estimation method in this paper. Our goal is to study which determinants will increase the likelihood of finding jobs. Instead of directly estimating the job-finding probabilities, we are interested in ratios between different probabilities in order to examine the difference between various job searching statuses. Our estimation method has two steps. First, we estimate the individual-level probabilities of finding jobs which are needed in the non-linear estimation as variables. Second, we build the non-linear estimation model which addresses the influences of searching efforts and previous work experience, as well as other individual characteristics.

Probability Estimation

We study the probability of a job seeker successfully finding a job, J. We develop a nonstructural estimation for the binary status J on an individual level:

$$J_s = \begin{cases} 1 \text{ if } \alpha X_s + \epsilon_s \geq 0, \\ 0 \text{ if } \quad \text{otherwise} \end{cases} \tag{1}$$

J_s is a binary-status variable of whether a job searcher "s" has found a job. This variable equals 1 if a job has been found, and 0 otherwise. α includes the coefficients of all individual characteristics in X_s. This X_s includes one's education background, age, gender, family structure, and marital status. Specifically, we split the error term $\in_s$ into three parts: ρ_t, which represents the year fixed effect; a region-specific effect θ_r, which is time-invariant; and an unobserved white noise ς_s. Based on Eq. (1) and because of the binary-status characteristics of the firm's payment status, we used a probit framework:

$$J_s = \begin{cases} 1 \text{ if } \alpha X_s + \rho_t + \theta_r + \varsigma_s \geq 0, \quad \varsigma_s \sim N(0,1) \\ 0 \text{ if } \quad \text{otherwise} \end{cases} \tag{2}$$

Based on the estimation results of Eq. (2), we then further predict the job-finding probability $\hat{J}_{it}$. This is done within the statistical software R, after we estimate Eq. (2) with the probit regression.

Probability Decomposition on Job Finding

We estimate people's differentials upon these two estimated probabilities through two aspects. The first is to see whether the person has been actively searching for a job. An active searcher is defined as a person who not only sends resumes but also uses his or her social networks as well as the public assistance to seek a job. The second is to see whether the person has been employed previously or not. Assume that the probability of finding a job, $\hat{J}$, is a weighted average among probabilities of job finding under four statuses: actively searching and previously employed $\hat{J}_e^a$; actively searching and never been employed before $\hat{J}_u^a$; inactively searching and previously employed $\hat{J}_e^i$; and inactively searching and never been employed before $\hat{J}_u^i$. For each individual job searcher, the equation is specified as:

$$\begin{aligned} \hat{J} &= \hat{J}_e^a \times Pr(\text{actively searching\&previously employed}) + \\ &\hat{J}_e^i \times Pr(\text{inactively searching\&previously employed}) + \\ &\hat{J}_u^a \times Pr(\text{actively searching\&never been employed}) + \\ &\hat{J}_u^i \times Pr(\text{inactively searching\&never been employed}) \\ &= \hat{J}_e^a \times Pr_e{}^a + \hat{J}_e^i \times Pr_e{}^i + \hat{J}_u^a \times Pr_u{}^a + \hat{J}_u^i \times Pr_u{}^i \end{aligned} \tag{3}$$

where $Pr(j)$ represents the probability of getting into the status j. There are four statuses in total: actively searching & previously employed, inactively searching & previously employed, actively searching & never been employed, and inactively searching & never been employed. The probability of actively searching for jobs $Pr^a = Pr_e{}^a + Pr_u{}^a = 1 - Pr^i$, where $Pr^i = Pr_e{}^i + Pr_u{}^i$, representing the probability of inactively searching. The probability of being employed before $Pr_e = Pr_e{}^a + Pr_e{}^i = 1 - Pr_u$, where $Pr_u = Pr_u{}^a + Pr_u{}^i$, representing the probability of never been employed before.

Next, we use ψ as the ratio between the probability of job finding due to inactively searching and actively searching, or the inactive–active job-finding ratio:

$$\psi = \hat{J}^i / \hat{J}^a = \hat{J}_e^i / \hat{J}_e^a = \hat{J}_u^i / \hat{J}_u^a \tag{4}$$

Use φ as the previously employed–unemployed job-finding ratio, as the ratio between probability of job finding of being previously employed and that of never being employed before:

$$\varphi = \hat{J}_e / \hat{J}_u = \hat{J}_e^a / \hat{J}_u^a = \hat{J}_e^i / \hat{J}_u^i \tag{5}$$

Notice that we assume the inactive–active job-finding ratio is the same between those who were previously employed and those who were never previously employed. In other words, how much more likely to find jobs if a person actively than inactively searches for jobs does not depend on one's previous employment history. In our paper, we define "actively searching" as one not only sending resumes but also using social networks and government assistance, which do not need previous working experience to successfully take effect. Similarly, we assume the previously employed–unemployed job-finding ratio is the same between those who conduct active search and those who conduct inactive search. If a person has previous working experience and thus finds jobs more easily (or difficult), it does not depend on his or her searching methods. Eq. (3) can be rewritten as:

$$\begin{aligned}\hat{J} &= \hat{J}_e^a\left(Pr_e{}^a + \psi Pr_e{}^i\right) + \hat{J}_u^a\left(Pr_u{}^a + \psi Pr_u{}^i\right) \\ &= \hat{J}_e^a/\varphi\left[Pr^a + (\varphi{-}1)Pr_e{}^a + \psi\left(Pr^i + (\varphi{-}1)\,Pr_e{}^i\right)\right]\end{aligned} \tag{6}$$

The logarithm form of Eq. (6) is:

$$\log(\hat{J}) = \log\left(\hat{J}_e^a\right) - \log\varphi + \log\left[Pr^a + (\varphi{-}1)Pr_e{}^a + \psi\left(Pr^i + (\varphi{-}1)Pr_e{}^i\right)\right] \tag{7}$$

Use a linear stochastic function $\beta_0 + X'\beta + \xi$ to substitute the unobserved $\hat{J}_e^a$; we then have

$$\log(\hat{J}) = \beta_0 + \log\left[\psi + (1{-}\psi)Pr^a + (\varphi{-}1)\left(Pr_e{}^a + \psi Pr_e{}^i\right)\right] + X'\beta + \xi \tag{8}$$

where X includes a vector of variables that determines the probability of finding jobs conditional on searching efforts and previous experience and ξ is the random error term. If $\psi > 1$, people who are not actively searching for jobs are more easily able to find a job. If $\varphi > 1$, previously employed job searchers are more likely to find jobs than those who have never worked before.

In order to estimate Eq. (8), we first need to estimate the individual-level probabilities (Pr^a, $Pr_e{}^a$, $Pr_e{}^i$). Following the same logic and estimation method in "Probability Estimation", we start from a probit model on three probabilities of a person "s": being actively searching, being previously employed, and being both actively searching and previously employed, as Eq. (9) exhibits.

$$\left[Pr_s^a, Pr_{es}, Pr_{es}^a\right] = \begin{cases} 1 \text{ if } \alpha X_s + \rho_t + \theta_r + \varsigma_s \geq 0, & \varsigma_s \sim N(0,1) \\ 0 \text{ if otherwise} \end{cases} \tag{9}$$

Based on the binary estimation results, we then predict these individual-level probabilities and attain their predicted values ($\hat{Pr}^a$, $\hat{Pr}_e$, $\hat{Pr}_e{}^a$). $\hat{Pr}_e{}^i = \hat{Pr}_e - \hat{Pr}_e{}^a$. Then, we use these predicted values in the estimation of Eq. (8). Our focus is to estimate ψ and φ, which show the disparity between searchers exhibiting different searching efforts and previous experience. To conduct the estimation, we use R's "non-linear least square" function. Given all the symbolic notes with super- and subscripts that we introduced above, Table 1 summarizes them all with corresponding explanations.

Data Description

The individual-level data used in this paper come from the 2009 National Employment Survey conducted by the *Instituto Nacional de Estadisticas Chile* (INEC), or from the National Statistics Institute of Chile. The original dataset contains job-relevant information on Chilean citizens, with over 35,000 observations per month. We then selected effective samples according to our needs and conducted the following tests. Since our paper studies people's job searching outcome, we only select those people who responded to the survey with a clear "Yes" or "No" answer when they were asked whether they had found jobs yet. This helps us boil down the sample size to 3174, so that we can efficiently focus on the subject of this paper—people's job searching outcomes. Table 2 reports summary statistics within the selective samples. Notice that we only conduct our investigation among those job searchers who were unemployed and reported searching activities in the past twelve months. These persons either still exhibit searching activities or they have already found jobs. Among all the 3174 job searchers reporting their searching outcomes, 18.4% have not found jobs yet.

We also consider several personal characteristics that contribute to job searching results. First, we consider whether the person has been actively searching, in other words, whether the worker has specifically resorted to one of the following searching methods: consulting directly with employers or employment agencies, subscribing to the announcements in the municipal employment office, asking relatives or friends for recommendations, and posting and updating announcements or resumes on the Internet to establish himself or herself. If this person did not try any of the above methods to search for jobs, then he/she is considered to be "inactive". One's job searching efforts directly affect the searching outcome. The statistics show that most of the job searchers (94.2%) are still not actively searching.

Second, we consider whether the person has been previously hired elsewhere or has certain employment experience. In the national employment survey, people, whether they have jobs or not, are asked if they have worked for other employers before. In our sample of unemployed job searchers, we use this information to indicate their previous work experience. Such an experience shows that a person has received relevant career training, and this creates more

Table 1 Description of probability variables

Symbol	Description	Symbol	Description
J	Binary-status variable of whether jobs have been found	$\hat{J}$	Probability of finding jobs
$\hat{J}^a$	Probability of finding jobs for a searcher who is actively searching	$\hat{J}_e^a$	Probability of finding jobs for a searcher who was previously employed and actively searching
$\hat{J}^i$	Probability of finding jobs for a searcher who is inactively searching	$\hat{J}_e^i$	Probability of finding jobs for a searcher who was previously employed and inactively searching
$\hat{J}_e$	Probability of finding jobs for a searcher who was previously employed	$\hat{J}_u^a$	Probability of finding jobs for a searcher who was never previously employed and actively searching
$\hat{J}_u$	Probability of finding jobs for a searcher who was never previously employed	$\hat{J}_u^i$	Probability of finding jobs for a searcher who was never previously employed and inactively searching finding jobs
Pr^a	Probability of a searcher being actively searching	Pr^i	Probability of a searcher being inactively searching
Pr_e	Probability of a searcher having been previously employed	Pr_u	Probability of a searcher never being previously employed
Pr_e^a	Probability of a searcher being previously employed and actively searching	Pr_u^a	Probability of a searcher being never previously employed and actively searching
Pr_e^i	Probability of a searcher being previously employed and inactively searching	Pr_u^i	Probability of a searcher being never previously employed and inactively searching
ψ	J^i/J^a; inactive–active searching job-finding ratio	φ	J_e/J_u; previously employed–unemployed job-finding ratio

leverage when he or she is on the job market. The data show that 87.1% of the survey respondents have worked before. In our Chilean sample, the majority of the job searchers are experienced.

Third, we consider whether the person has received higher education or not, or, to be more specific, whether the person has a college-level degree or education beyond a high school diploma, or has attended any technical and professional training institutes. A job searcher's education background directly affects whether he or she can successfully find a job, and what the job position is. Still, only 67.7% of the job searchers received only an average, common education at most. Workers with long-term professional training and higher education are still rare in Chile.

Furthermore, gender and age are important factors which influence one's job searching capability and outcome. Discrimination against females and elders still substantially persists even today, hindering them in finding jobs sooner and more easily than others. The data indicate that 54.1% of job searchers are male, while half of the observed job searchers (50.4%) are older than 30 years of age.

In addition to one's job searching efforts, previous work experience, education background, gender, and age, we also consider other personal characteristics which affect the job searching outcome. The family structure and marital status are also considerations. We find that 58.3% of the job searchers have juveniles in their households. A total of 1499 (50.8%) of the searchers are married, while 1452 (45.7%) are single or widowed. Table 3 compares the statistics between job searchers with two different outcomes.

Table 2 Summary statistics of all sampled job searchers

Answers to the following questions	No		Yes	
	Number	Percent	Number	Percent
Has the person found a job yet?	583	18.4	2591	81.6
Has the person been actively searching for a job?	2989	94.2	185	5.8
Has the person been previously hired?	410	12.9	2764	87.1
Has the person received higher education?	2149	67.7	1025	32.3
Is the person male?	1458	45.9	1716	54.1
Is the person over 30 years of age?	1575	49.6	1599	50.4
Does the person have juveniles under 15 years old in the household?	1325	41.7	1849	58.3
Is the person married?	1452	49.2	1499	50.8
Is the person single or widowed?	1722	54.3	1452	45.7

Source: 2009 National Employment Survey, National Institute of Statistics of Chile

Reasons of Labor Mobility

We also look into the reasons why people leave their previous jobs, and we compare different types. The details are included in Table 4. Among those job searchers reporting their reasons for leaving previous jobs, 61.2% of those who do not have jobs yet left their previous jobs because of business reasons, such as the end of their contract or the bankruptcy of the company, while 58.6% among the job winners have experienced the same thing. Note that 6.7% of the searchers without jobs yet were dismissed from their previous jobs due to staff reduction, while 9.1% of the job winners were let go for the same reason.

Regarding gender discrimination, some job searchers were dismissed because they were pregnant. Compared with the job winners (0.3%), there is a slightly greater percentage of searchers (0.5%) who have not found jobs. Also, more job winners (6.1%) resign due to family or health issues than those who are yet without jobs (5.7%). Due to personal reasons, such as wanting a better life, higher income, or more job security, there are more job winners (7.3%) who have left previous jobs compared with those who have not yet found jobs (3.4%).

So far, the statistics show that personal characteristics, such as gender, age, family structure, and education all have differentiated impacts on job searching outcomes. However, specific investigations need to be done to examine the effects of work experience, as well as searching methods.

Estimation Results

Here, we present and analyze the estimation results based on the methods explained in "Methodology". We begin with the probability estimation and then analyze the estimation of the job finding probability of inactively searching relative to actively searching, as well as those of previous work experience versus no experience at all.

Probability Estimation Results

The estimation results on probit regressions are shown in Table 5. Column (i) is based on Eq. (2), which examines the influences of individual characteristics on the job finding outcome. We find that if a job searcher has received higher education in colleges or other professional institutes, he or she is more likely to successfully find a job. As a job searcher gets older, the job finding probability declines. We also find that those who have more juveniles in the family, or are single or widowed rather than married, have a lower probability of finding jobs.

Columns (ii), (iii), and (iv) are based on Eq. (9), which examines how the same independent variables affect three binary dependent variables: first, whether one has been actively searching for jobs; second, whether one has been employed previously; and third, whether one has been both actively searching and previously employed. If a job searcher has a higher education background, he or she is more likely to be new on the job market and not actively searching. This is also an interesting "adverse selection" phenomenon: well-educated people feel more confident, and they therefore do not spend too much time in job searching. Instead, they will rely more on their professional background, rather than previous work experience. Also, the older a person is the more likely that he or she is relying on previous work experience, instead of sending and updating resumes and using social networks and public resources to actively search for jobs. Furthermore, we also find that the more juveniles a job searcher has in the family, the more likely that he or she has been previously employed. This is also easily explainable. Older job searchers tend to raise more kids than younger ones, and, as discussed above, they tend to have already worked somewhere else. People's marital status also exert significant impacts. Those who got married are more likely to find jobs than single or widowed people.

The statistics of estimated probabilities based on the probit estimates in Table 5 are listed in Table 6. On average, the job searchers exhibit a probability of 81.7% for finding a job in the end. The average probability of actively searching is 5.8%, while that of being previously employed is 87.1%. It is highly likely that a person does not actively search for jobs, but previous work experience is highly expected among the job searchers.

Non-linear Estimation Results

Based on these estimated probabilities, we will then apply them into the estimation of Eq. (8). Furthermore, not only have we done the estimation among all the observed job searchers but we also group them according to their education background, gender, and age. We will investigate the influences of searching efforts and previous work experience and how these will differ among the various groups of job searchers.

Full Sample

We start from the estimation results within the full sample, regardless of job searchers' education background, gender, and age. The results are displayed in column (i) of Table 7. To be specific, we non-linearly estimate two factors: first, ψ, the ratio of job finding probabilities between inactive and active searching and second, φ, the ratio of job finding probabilities between those with and without previous work experience. Within the full sample, both ratios are significantly lower than 1. In other words, the probability of a

Table 3 Statistics of job searchers with different outcomes

	No jobs yet		Already with jobs	
	Number	Percent	Number	Percent
Total number	583	100	2591	100
Number of persons				
Actively searching	37	6.3	148	5.7
With previous work experience	501	85.9	2263	87.3
With higher education	201	34.5	824	31.8
Who are males	314	53.9	1402	54.1
Over thirty years of age	663	54.5	936	58.5
With juveniles in the household	340	58.3	1509	58.2
Married	267	45.8	1232	47.5
Single or widowed	286	49.1	1166	45.0

person being inactively searching is lower than that of one being actively searching, and the probability of a person with previous work experience is lower than that of a person without. Overall, compared with those who actively searched for jobs, inactive searchers are less likely to find jobs. A job searcher's efforts does matter when it comes to the searching outcome; sending and updating resume and using one's social networks and public assistance greatly help one to find jobs more easily. Surprisingly, those people with previous experience are less likely to find jobs than those who have never worked before.

In addition, we find that age exerts a positive influence on one's job finding probability; older workers are more likely to find jobs. Being a female will negatively affect the job finding outcome, as gender discrimination still persists in the workplace in Chile. Unsurprisingly, it is more difficult for people who have only received an average, common education to find jobs. One's education and professional training background do matter on the job market. What is more, we also find that a higher household juvenile ratio brings up the job-finding likelihood. When there are more juveniles in a person's household, that person is expected to be more experienced on the job market and to have a better chance of winning a job. Lastly, married searchers are more likely to find jobs than those who are single or widowed; this is in accordance with our findings in Table 5.

By Education Level

We divide the full sample into two subsamples: one with job searchers who only receive an average, common education and the other with job searchers who hold at least college-level degrees or have graduated from professional or technology institutions. With ψ being significantly lower than 1, a person with an average education is less likely to find jobs if he or she is inactively, instead of actively, searching. It is fairly explainable. By actively searching, a person is more likely to find potential employers and win a job position. Meanwhile, with φ being significantly lower than 1 as well, an average-educated job searcher is less likely to succeed if he or she has been employed before. Therefore, the best opportunity for a person with an ordinary education background is when he or she first enters the job market. Such a job searcher tends to be young and has just finished schooling, which becomes a leverage over someone who is experienced and has only received an average, common education.

For one who has received higher and professional education, the results are totally different. In this case, searching methods

Table 4 Reasons for job searchers leaving previous jobs

	No jobs yet		Already with jobs	
	Number	Percentage	Number	Percentage
Business reason	357	61.23	1517	58.55
Retired	0	0.00	4	0.15
Dismissed because of staff reduction	39	6.69	235	9.07
Dismissed because of pregnancy	3	0.51	8	0.31
Resigned due to family or health reasons	33	5.66	159	6.14
Resigned for personal reasons	20	3.43	188	7.26

Table 5 Probit estimation results on a person finding jobs, actively searching, being previously employed, and both actively searching and being previously employed

	Dependent variable: probabilities of			
	Finding jobs (i)	Active searching (ii)	Previous work experience (iii)	Actively searching and previously employed (iv)
Dummy (higher education receiver)	0.103*	−0.146*	−0.116*	−0.161*
	(0.058)	(0.086)	(0.064)	(0.089)
Age	−0.012***	−0.009**	0.024***	−0.013***
	(0.003)	(0.004)	(0.003)	(0.004)
Dummy (female)	0.002	−0.121	−0.397***	−0.201**
	(0.055)	(0.079)	(0.063)	(0.084)
Household juvenile ratio	−0.217*	−0.218	0.804***	−0.166
	(0.154)	(0.217)	(0.178)	(0.225)
Marital status				
Dummy (married)	−0.230**	0.110	−0.031	0.062
	(0.116)	(0.156)	(0.133)	(0.158)
Dummy (single or widowed)	−0.436***	−0.155	−0.147	−0.319*
	(0.121)	(0.168)	(0.139)	(0.173)
N. obs.	3174			
Region FE	Yes			
Time FE	Yes			

Note: ***, **, and * represent significance at 1%, 5%, and 10%, respectively

do not matter; a well-educated person who actively searches for jobs does not gain a significantly higher likelihood of succeeding than one who inactively searches. Instead of relying on the job searching activeness, this person has received specialized training which provides the most important advantage on the job market. Meanwhile, previous work experience will significantly help in finding a job. Among the job searchers with higher education backgrounds, the older, more experienced ones are more likely to find jobs. Education, personal skills, and professional experience are their major leverages.

Regarding the personal characteristic of age, a younger average-educated person tends to find jobs more easily, as does an older higher-educated person. This is consistent with our findings noted above concerning previous work experience. Moreover, more juveniles in one's household can increase the probability of finding jobs; this positive influence works more significantly among those with higher education backgrounds than those with average education backgrounds. Unsurprisingly, females encounter more difficulties on the job market. Men have better chances to win jobs than women, especially among those who did not receive a higher education. However, female job searchers with specialized training encounter fewer difficulties than those without. Also, married average-educated persons are more likely to find jobs, and so are those who are single or widowed and well-educated.

By Gender and Age

In order to examine the influence of searching efforts and previous experience on the job searching outcome, besides education level, we also conduct group analysis based on gender and age; the results are shown in Table 8. Let us first compare male and female job searchers. An inactively searching man is significantly much less likely to find a job than an active one, who uses his personal networks, as well as public assistance resources. However, no difference can be

Table 6 Summary statistics of estimated probabilities

	Min.	Median	Mean	Max.
Probability of				
Finding jobs (J)	1e−7	0.826	0.817	1.000
Actively searching (Pr^a)	1e−7	0.057	0.058	0.577
Being previously employed (Pr_e)	1e−7	0.896	0.871	1.000
Both actively searching and being previously employed (Pr_e^a)	1e−7	0.412	0.0533	0.404

Table 7 Estimation results in full sample and by education level

Dependent variable			
$\hat{J}$ (probability of finding jobs)		Education	
	Full sample (i)	Average education (ii)	Higher education (iii)
ψ (inactive–active searching job-finding ratio)	0.138*** (0.018)	0.238*** (0.015)	1.461 (1.995)
Significance for null ψ =1	***	***	
φ (previously employed–unemployed job-finding ratio)	0.854*** (0.021)	0.626*** (0.026)	1.786*** (0.047)
Significance for null φ =1	***	***	***
Dummy (higher education receiver)	0.279*** (0.052)	–	–
Age	1.602*** (0.111)	−1.525*** (0.185)	4.995*** (1.265)
Dummy (female)	−0.150** (0.059)	−0.799*** (0.158)	−0.024*** (0.004)
Household juvenile ratio	0.015*** (0.003)	0.039*** (0.006)	0.182*** (0.060)
Marital status			
Dummy (married)	1.702*** (0.265)	2.786*** (0.288)	−7.629*** (1.247)
Dummy (single or widowed)	0.703*** (0.122)	1.117*** (0.189)	−3.474*** (0.644)
R^2	0.055	0.051	0.047
N. obs.	3174	2149	1025
Region FE	Yes		
Time FE	Yes		

Note: ***, **, and * represent significance at 1%, 5%, and 10%, respectively

statistically detected between active and inactive female searchers; their searching efforts does not matter in job searching.

Moreover, previous work experience will significantly help a female but not a male in successfully finding a job. Compared with their male competitors, female searchers on the job market depend more on their professional experience than on their searching methods. This can also be attributed to a "self-selection" theory; i.e., only well-trained women opt to enter the job market and compete with men. Due to her abundant knowledge and skills, an experienced woman has better opportunities in the workplace than an unexperienced one.

A better educated and trained person has more chances to find jobs; comparatively speaking, a higher education background helps women more significantly than it does men. Besides, age also exerts significant positive effects on the job searching outcome. An older male can find jobs more easily than an older female. A female searcher's family structure does not affect her searching outcome. However, the more juveniles a male has in his family, the more probable it is that he is older and more experienced, and the easier it will be for him to find a job. Single or widowed males are more likely to find jobs than those who are married, while it is easier for married females to find jobs than it is for single females.

Next, let us turn to job searchers at different ages. Since the median age distribution within our sample is thirty, we define those who are older than thirty years of age as mature searchers, while we define those not of that age as young searchers. Actively searching through sending resumes and social network as well as public assistance will significantly help a mature job searcher. Being mature, a person tends to be better aware of the more frequently used searching skills and also tends to use these skills independently. Stronger searching efforts will help such a person to find a job more easily. However, searching efforts does not effectively help a young worker; the probability of finding jobs after inactive searching is not significantly different than after active searching.

Without previous work experience, a mature worker is less likely to find a job. An older and more experienced person, no matter why he or she left the previous employer, will encounter fewer difficulties when trying to find the next job. Therefore, previous work experience will help one to succeed in job searching. However, our finding is completely different

Table 8 Estimation results by gender and by age

Dependent variable				
$\hat{J}$ (Probability of finding jobs)	Gender		Age	
	Male (i)	Female (ii)	Mature (> 30 yrs old) (iii)	Young (≤ 30 yrs old) (iv)
ψ (inactive–active searching job-finding ratio)	0.095**	1.790	0.298***	1.037
	(0.037)	(1.269)	(0.016)	(1.741)
Significance for null $\psi = 1$	***		***	
φ (previously employed–unemployed job-finding ratio)	0.102***	1.517***	1.581***	0.606***
	(0.037)	(0.065)	(0.074)	(0.026)
Significance for null $\varphi = 1$	***	***	***	***
Dummy (higher education receiver)	0.086***	1.954***	0.690***	8.494***
	(0.033)	(0.439)	(0.155)	(2.390)
Age	3.483***	0.204***	2.243***	0.040
	(0.765)	(0.006)	(0.258)	(1.215)
Dummy (female)	–	–	−1.095***	−0.126***
			(0.022)	(0.037)
Household juvenile ratio	0.004***	−0.029	0.060***	0.047
	(0.001)	(0.021)	(0.008)	(0.031)
Marital status				
Dummy (married)	−1.046***	3.631***	5.060***	−3.683***
	(0.380)	(0.864)	(0.485)	(1.061)
Dummy (single or widowed)	−0.575***	1.486***	1.714***	−1.857***
	(0.213)	(0.039)	(0.239)	(0.611)
R^2	0.047	0.045	0.055	0.045
N. obs.	1716	1458	1599	1575
Region FE	Yes			
Time FE	Yes			

Note: ***, **, and * represent significance at 1%, 5%, and 10%, respectively

for a young searcher who has worked previously. With previous work experience, a person who is younger than thirty years of age will be less likely to find jobs. Thus, being experienced does not necessarily bring leverage to a young person on the job market.

Unsurprisingly, being a female decreases a job searcher's chance of finding jobs, as gender inequality still persists in Chile. The job-finding chances are much more limited among female workers over thirty years of age than those who are younger. As a female job searcher is aging, it becomes less and less likely that she will find a job. Furthermore, single young searchers are more likely to find jobs than those who are married, while married mature searchers have better chances than single or widowed mature searchers. Again, being older and more experienced will greatly enhance one's job-finding probability in Chile.

Discussion and Policy Implications

Based on the above results, we find that job searching efforts and previous work experience do have a significant impact on and change people's job search results, but these impacts also vary greatly according to their personal characteristics. Generally speaking, actively sending resumes, using social networks as well as public assistance, indeed help a person to find jobs. However, after we group job searchers based on their gender, age, and education background, it is further found that actively searching only helps males and not females, or people who are over thirty years of age, or those with only average, common education and not those with higher or professional education. Interestingly, we find that females and well-educated persons are both minorities on the job market in Chile. Meanwhile, the percentage of young people is also lower than that of mature people. Therefore, for these minorities, how actively they search for jobs does not matter significantly; it is their own qualifications, such as education background and training experience, that determine their searching outcomes.

Moreover, a job searcher with previous work experience is not necessarily more likely to succeed on the job market than one without an employment history. Comparatively speaking, women, or those over thirty years of age and those with higher education background, can find jobs

easier if they have been employed before. Moreover, previous work experience exerts the opposite effect on the job search outcome of men, those people under thirty years of age, and those who only received an average, common education.

In summary, the interactive influence of searching methods, employment history, and personal characteristics on people's job searching results is complicated yet highly significant. During the job search process, some people can successfully find jobs eventually, while others cannot. The different job search outcomes are caused by various reasons. Work experience and the use of social network and public employment services are two objective reasons, whose influence will be differentiated according to personal characteristics such as age, gender, and education background. We find strong evidence that female workers, especially women without college education or special training, are discriminated by gender and age in Chile's labor market. As a female job searcher is aging, it becomes less and less likely that she will find a job. We also find evidence that male workers without special training or college education are discriminated by age in Chile's labor market. Therefore, the government needs to alleviate the society's gender and age discriminations; propaganda against these discriminations should be peddled widely among the employers.

Meanwhile, the government should also ensure that both men and women have equal opportunities to receive education, especially higher and professional education which can significantly help female job searchers. Higher education background also greatly helps young job searchers achieve their goals on the job market. Thus, it is always important for the government to promote and widely spread the importance of education among the citizens.

Furthermore, in order to facilitate people's job searching and mitigate the unemployment issue, the government also needs to specify policies among particular groups of people. For example, the government should establish more employment agencies which provide effective consultation and build a close relationship between local enterprises and the municipal employment offices. These facilities will help ordinary workers who only receive an average education to find jobs faster. In order to encourage women to participate in the labor force, the government should help them accumulate professional experiences; a consistent career path will be significantly helpful.

Conclusion

This paper innovatively examines the determinants of people's job search outcomes. Specifically, we examine whether job searchers' use of social network and public employment services and their previous work experience can affect their job searching results, and how the effect is different according to their gender, age, and education background. Our data come from the individual-level 2009 National Employment Survey conducted by the INEC, the National Statistics Institute of Chile. Instead of estimating job-finding probabilities directly, we build non-linear models to estimate the differences of job-finding probabilities between two groups: (1) job seekers using and without using social network and public employment assistance and (2) job searchers with and without previous work experience.

Overall, we find that it is more likely for job seekers to find jobs if they are actively searching with their personal networks and with public assistance resources. Also, job-finding chances are greater for those newly entering the job market without a previous employment history. However, the findings do vary according to job searchers' personal characteristics, such as age, gender, and education level. Actively searching and being new to the job market only significantly help males and those with an average, common education to find jobs. For females, as well as for higher-education receivers, previous work experience, instead of search methods, matters a great deal. For a job searcher who is over thirty years of age, it is important for him or her to use social network and employment services and to have previous experience. Generally speaking, being experienced and well-educated both add much leverage for people in finding jobs in Chile. For minorities in the workplace, such as females, it is even more important to have a higher education background and professional experience. Still, significant uncertainties exist; the actual job search outcome depends on the personal characteristics of each job searcher.

Based on our research, there are several possibilities for further investigation that can be done. On the one hand, in this paper, we estimate job search outcomes as the ratio between job-finding probabilities under different statuses. In an alternative setting, estimating these probabilities directly may reveal more interesting findings about how the personal characteristics of job searchers will affect their searching outcomes. On the other hand, if we are able to decompose one's job-finding probability among these characteristics—for example, the searching methods, experience, gender, age, education and background—we can determine how much each characteristic contributes to a person's job-finding outcomes and how the government can facilitate the searching process of different groups of people, and therefore, effectively lower the unemployment rate.

Compliance with Ethical Standards

Conflict of Interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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