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Abstract

We use matched employer-employee data from the Chilean Internal Revenue Service to analyze within and between-sector job transitions in formal employment in Chile between 2005 and 2016. We find a large degree of worker mobility between sectors. In fact, for workers who separate from their jobs, the likelihood of finding a job in a new sector is on average similar to the likelihood of staying in the origin sector. However, average mobility hides significant heterogeneity between workers who change jobs frequently and those with more stable career paths. On average, both direct and indirect employment transitions are linked to wage gains, especially if workers shift to a new sector. This suggests that for a large group of workers the wage costs of moving across sector are relatively small.

Resumen

Usando datos censales empleado-empleador del mercado asalariado formal chileno provistos por el Servicio de Impuestos Internos, se analizan los cambios de empleo entre sectores económicos y dentro de un mismo sector. Los resultados revelan que para los trabajadores que se cambian de empleo, la probabilidad de mantenerse en el mismo sector es similar a la probabilidad de cambiarse de sector. Sin embargo, la movilidad promedio esconde una importante heterogeneidad entre trabajadores que cambian frecuentemente de empleo y otros que tienen trayectorias laborales más estables. En general, los cambios entre empleos asalariados formales se asocian a ganancias salariales, las cuales son mayores cuando el cambio de empleo implica también un cambio de sector. Estos resultados sugieren que para un porcentaje relevante de los trabajadores formales los costos de moverse entre sectores son relativamente pequeños.

*Opinions and conclusions expressed in this paper are those of the authors alone and do not necessarily represent the views of the Central Bank of Chile. All results have been reviewed to ensure no confidential data are disclosed. Emails: raldunate@bcentral.cl; gcontreras@bcentral.cl; mtapia@bcentral.cl.

I Introduction

The response of the labor market to aggregate and sectoral shocks is key for the aggregate dynamics of employment, production, and prices. Thus, a careful empirical characterization of labor market dynamics provides valuable information on the structure of the economy and its response to cyclical fluctuations. An analysis of labor markets flows and their consequences for workers and firms provides insights into the reallocation of factors between firms and sectors, and its relation with the dynamics of productivity and human capital accumulation.

A crucial feature of the labor market is its ability to reallocate labor in response to shocks, so that workers move towards their most productive uses. This does not only relate to the allocation of workers across firms in a given sector, but also to the capacity of shifting employment across sectors. This is particularly important in the context of open economies subject to relative prices shocks that require changes in relative sectoral labor allocations to attain efficiency and enhance aggregate productivity.[1] If labor mobility across sectors is limited, the economy will be less able to respond to shocks, with negative consequences in terms of productivity and unemployment. For example, Song et al. (2012) argue that one cause of the increase of the unemployment rate since 2007 in the U.S. is the mismatch across sectors. Evidence for Italy supports this notion: the reduction in mobility between industries relates to increases in the unemployment rate (Garonna & Sica, 2000).

Besides their importance for overall efficiency, the conceptual difference between job changes within- and between-sectors provides another justification for studying the process of sectoral transitions (Shin & Shin, 2008; Walker, 2013). For example, a possible loss of sector-specific human capital can hinder transitions between sectors, resulting in higher wage costs compared to finding a new job in the same sector (Neal, 1995; Dix-Carneiro, 2014).

This paper aims to provide an empirical characterization of employment sectoral transitions in Chile, a small open economy exposed to significant relative price shocks that can require a large degree of labor reallocation across economic sectors.[2] This

[1] As discussed by Aaronson et al. (2004), "in a well functioning economy, the growth in international trade, shifts in product demand, and productivity growth that varies across sectors; all imply that resources constantly need to be reallocated from one part of the economy to another".

[2] Benguria et al. (2018), using data from Brazil, study the impact of commodities prices boom in the economy and differentiate two channels: a "wealth channel" related to a rise in domestic demand and a "cost channel" because of a wage increase, that mostly affects sectors that require unskilled-workers. According to their results, two-thirds of the inter-sectoral workforce reallocation is related to the later channel.

paper addresses several questions. How frequent are job transitions between sectors? How do they compare to within sector changes? Are there differences depending on the initial sector? How long do job transitions take? What is the impact on wages of job transitions within and between sectors? Are there differences by gender and age?

To answer these questions, we use census data from the Chilean Internal Revenue Service on formal employment between 2005 and 2016, which covers nearly 60% of total employment in the country. This matched employer-employee administrative data provides information on labor earnings, job tenure, and economic sector of employment for more than nine million workers, and allows us to track workers across job transitions.

The results show that mobility between sectors is significant: 61% of all formal employees worked in at least two sectors between 2005 and 2016, although women have fewer transitions between sectors than men. In addition, workers who move between formal wage jobs are on average equally likely to change to a different sector than to stay in their current one. However, the frequency of job changes varies considerably across sectors.

On average, transitions between formal wage jobs take nearly seven months and are linked to wage gains that appear to be increasing in the length of the transition process. While on average wage gains are larger for workers who move to a different economic activity, there is significant heterogeneity across sectors. Furthermore, wage costs vary with the age and gender of workers.

Our results reveal that, for a large group of workers, transitions between sectors do not seem to entail a significant cost in terms of wages. While this is consistent with an economy that adjusts well to changes in relative prices, it is also suggestive of low levels of sector-specific human capital. Addressing these hypotheses and their interaction in more detail is a relevant area for future research.

This paper is organized as follows: section II describes the database and the adjustments made on the raw data, section III studies the frequency of transitions between formal wage jobs, and section IV analyzes its implications for wages and the length of transitions. Finally, section V concludes.

II Matched Employer-Employee Database

The main source of data used in this article is the Annual Affidavit on Income (No. 1887), provided by the Chilean Internal Revenue Service (IRS) between 2005 and 2016,

that links firms with all the salaried employees they hire. These administrative records cover all formal workers (across private and public sectors), which adds up to nearly 60% of total employment in the country.[3] The information included in this dataset is reported in March of each year, since 2006, by every firm hiring at least one worker for at least a month the previous year. Employers report the months each employee worked at the firm and the annual labor earnings each one received. Labor earnings include base salary, incentives and rewards, payments for agreements, sales commissions, and overtime pay.[4] Therefore, we can recover information on a measure of average monthly wages and the duration of individual jobs, as well as being able to track more than nine million formal employees across their job transitions.

We match this dataset with two other sources. First, using information provided by the Chilean Register Office we assign basic demographic characteristics - gender and date of birth - to each worker.[5] Second, we use the definition created by National Accounts of the Central Bank of Chile to assign an economic sector to each firm.[6] We aggregate economic activities into ten broad sectors: Agriculture, forestry, and fishing (henceforth agriculture); Mining and quarrying (henceforth mining); Manufacturing; Energy, gas, and water supply (henceforth utilities); Construction; Trade, hotels, and restaurants (henceforth trade); Transport, storage, and communication (henceforth transport); Banking, insurance, and real estate (henceforth banking); Public Administration; and Community, social, and personal services (henceforth personal services).

Given that companies self-report the information on the Annual Affidavit on Income, we need to clean the dataset from dubious observations. We use the data cleansing procedure described in Albagli et al. (2017a) as a starting point.[7] As we use monthly and not annual data to study sectoral transitions between formal wage jobs, we add three steps for a better identification of employment relations. First, we impute missing

[3]In 2017, data from the New National Employment Survey (*NENE* by its Spanish acronym) conducted by the National Statistics Institute shows that the share of formal wage jobs to total employment was 57%. The remaining 43% is divided into informal wage jobs (12%), own-account workers (22%), employers (4%), domestic services (4%), and contributing family workers (1%).

[4]This report is used to file the Income Tax Return of formal wage workers, so it has important tax implications and is audited by the IRS.

[5]To protect confidentiality of tax information, data provided by both the IRS and the Chilean Register Office are unnamed by an algorithm made by the IRS.

[6]Firms are classified according to Revision 4 of the International Standard Industrial Classification of all economic activities (ISIC).

[7]Albagli et al. (2017a) drop duplicated observations and impute missing observations when they suspect the firm did not report some workers by mistake. In addition, they consolidate firms that might be part of a business group and unify the records of employees working in firms they believe were merged, acquired or divided.

data for employees with zero reported income but a positive amount of months worked, and those with positive income but no working months on record.[8] Second, we fill in jobs when we suspect that the worker is on medical leave for less than one year, i.e., when a worker has a gap with the same employer at both ends. After these corrections, we interpret the remaining employment gaps as true job transitions between formal jobs. Third, given the focus of this work on sectoral transitions, we drop from the sample firms and workers employed in firms for which the economic sector is not reported.[9]

To identify the timing of a given employment transition, we require that all workers have a unique job at any given month. For workers with simultaneous jobs, we define their main job as follows:

- If a job starts after and ends before another one, we eliminate the shorter relationship, keeping the longer one as the main job.
- If a worker has two or more employment spells that start and end at the same time, the one with the highest total wage is the main job. In the unlikely case that the wages coincide exactly and both jobs belong to the same sector, we determine the main job randomly. If, on the other hand, the jobs pay the same wage but they do not belong to the same sector, we eliminate the worker from the sample, since we cannot determine the primary sector.
- If a worker has jobs that overlap (one ends after the other starts), we drop the overlapping months for the shorter relation. If both jobs have the same duration, we delete the overlapping months for the lower paying relation. If they last and pay the same, we eliminate the overlapping months of the job that started later.

Finally, we drop all workers whose date of birth is not available at the Register Office or that are aged younger than 15 years old.

After dropping observations that could not be cleaned and removing employees working in firms without a sector, we are left with 42,684,389 labor relations from the database used in Albagli et al. (2017a). From these jobs, we eliminate 7.5% (3,211,611 relations) secondary jobs that are contained in another labor relationship, 0.3% (135,957

[8]We impute the missing records using information of other years of the same labor relation, so for this correction we can only deal with employees that worked in a firm for more than one year. As we cannot correct missing information of jobs that last only one year, we drop those employees, losing less than 0.1% of the observations used in Albagli et al. (2017a).

[9]We completely remove those workers from the sample, losing 1.3% of the observations used in Albagli et al. (2017a).

relations) that pay a lower wage in simultaneous jobs with the same start and ending dates, 0.0% (1,986 relations) that are identical simultaneous jobs in the same sector, and 0.0% (14,413 relations) identical simultaneous jobs but in different sectors. We delete an additional 2.3% of jobs (1,001,408 relations) for the 324,782 workers whose date of birth is not available at the Register Office, and 0.0% (3,528 relations) because workers are younger than 15 years old. As a result, the basic sample used for this analysis contains data for 38,315,486 labor relations for 9,205,960 workers between January 2005 and December 2016.

III Frequency of Transitions between Formal Wage Jobs

To analyze sectoral transitions between formal employment spells, we start by presenting descriptive statistics of the frequency of job changes for different groups of workers, distinguishing between transitions to a firm in the same sector (within-sectors transitions) from those to a firm in a different sector (between-sectors transitions). We try to answer the following questions:

(a) Across different time horizons, how many workers: (i) stay at the same job, (ii) have a new job in the same sector, (iii) are employed in another sector, or (iv) are not employed formally?[10]

(b) How do job dynamics vary across workers with different demographic characteristics?

(c) How do job dynamics vary across workers employed in different sectors?

First, for each month between 2005 and 2016, we measure mobility as the percentage of workers who are not at the same job after a given period of time (a month, a quarter, or a year). We distinguish between workers who have a new formal wage job in the same sector (within-sectors transitions) from those who switch sectors (between-sectors transitions), and those who are not employed formally (Figure 1).

[10]Since census data of the IRS covers only formal employment, being absent from the database at a given time does not necessarily mean that the worker is unemployed. The individual could also be out of the labor force or working but not as formal wage earner, like in the case of informal wage employees, self-employed workers, employers, workers in domestic service, or contributing family workers. Therefore, if an employee does not appear in the database, we can only say that the individual does not have a formal wage job.

After a month, on average, 94.1% of the workers are still in the same job. The remaining 5.9% can be split between workers who change job in the same sector (1.5%), who move to a different sector (1.0%), and those who are outside the formal labor market (3.4%). The proportion or workers who remain in the same job after a month is very similar to the evidence found in the United States, where 93.4% of the workers are in the same job (Fallick & Fleischman, 2004), and smaller than in Germany, where this figure is 97.7%. (Bachmann, 2005).

After twelve months, on average 32% of workers in the formal sector are no longer employed in their initial job: 17% have a new formal job (8% in the same economic sector and 9% in a new one) and 15% are outside formal employment. Despite using a different methodology, this result is consistent with previous evidence for Chile. For example, Albagli et al. (2017b) document an average reallocation rate of 36% between 2005 and 2014,[11] and Reinecke & Ferrada (2005) find an average reallocation rate of 30% between 1996 and 2003, based on data from the Chilean Safety Association (ACHS by its Spanish acronym).[12]

The majority of job transitions are indirect, and entail a temporary exit from formal employment, regardless of the time horizon. In fact, after a month or a quarter, there are more workers who are no longer employed in a formal job than those who have a new job (in the same sector or another), while after a year, both groups are similar (15% compared to 17%). This means that most transitions of formal employment are not job-to-job (or direct), but involve spending some time between jobs. This result is particularly relevant if we consider that job-to-job transitions are typically associated with voluntary job changes, where workers move in order to find a better match with their employers that will enable them to move up the job ladder (Haltiwanger et al., 2018).

A somehow surprising result is that, for all time horizons, job transitions across sectors are as frequent as those within the same sector. For example, after a quarter, employees who change jobs are as likely to move to a new sector as they are to stay in their current sector. Although this may appear to contradict the notion that moving to a firm within the same economic activity has lower economic costs than sector-switching due to human capital specificity, this result is similar to evidence found for the United

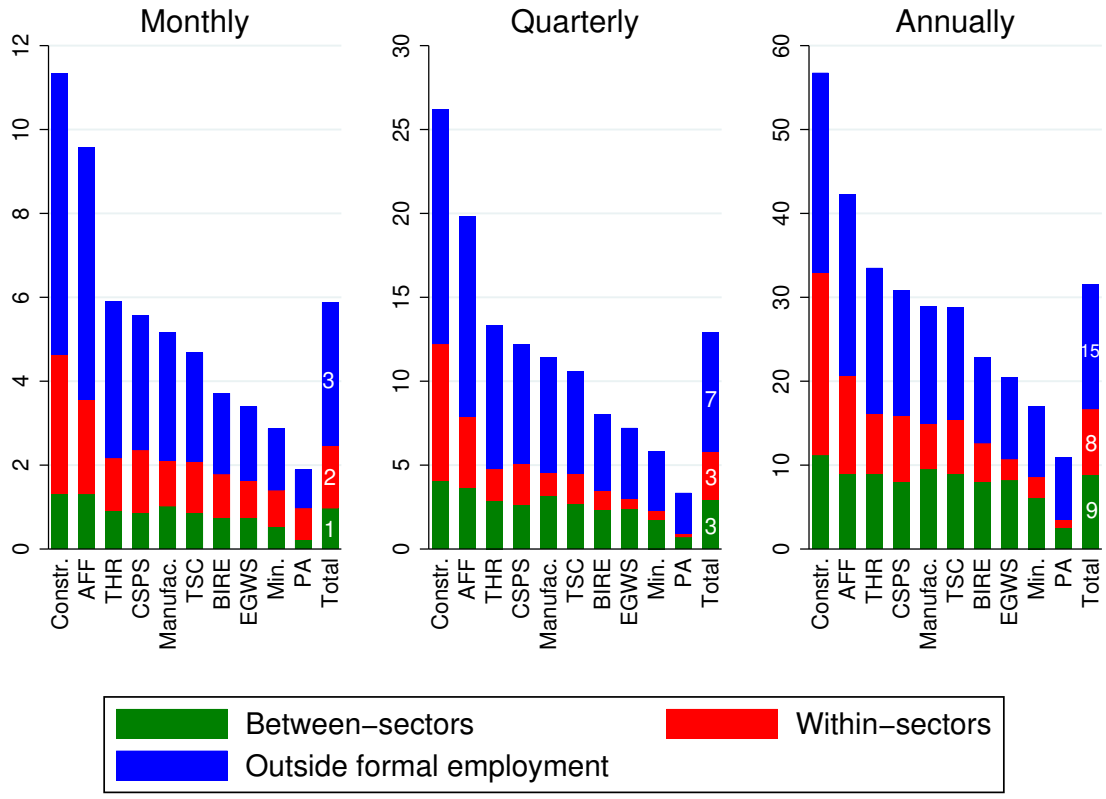
[11] Although we share the same database as Albagli et al. (2017b), their job mobility is calculated at the firm level, while labor mobility in this paper is defined at the worker level.

[12] Using data from the National Employment Survey from 1993 to 2009, García & Naudon (2012) find a larger degree of labor mobility on a quarterly basis (24% versus 13% in this paper). This difference might come from the fact that our results include only transitions between formal wage jobs, while their data covers the entire labor market.

States (Golan et al., 2007; Shin & Shin, 2008), the Czech Republic (Sorm & Terrell, 2000), and Germany (Bachmann & Burda, 2010).

Figure 1

Transitions of Formal Employment by Previous Sector for Different Time Horizons (*)
(share of workers relative to total employment in the previous sector, average 2005-2016)



(*) Sectors are ordered according to the share of workers that are not in the same formal wage job after t months, where $t = 1, 3, 12$. The following is the list of acronyms and abbreviations used: Agriculture, forestry, and fishing (AFF); Mining and quarrying (Min.); Manufacturing (Manufac.); Energy, gas, and water supply (EGWS); Construction (Constr.); Trade, hotels, and restaurants (THR); Transport, storage, and communication (TSC); Banking, insurance, and real estate (BIRE); Public Administration (PA); and Community, social, and personal services (CSPS). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

Nevertheless, we find a significant degree of heterogeneity in mobility across sectors. Construction and agriculture are the two sectors that have the highest degree of labor mobility, as well as being the only sectors where movements to a new job within the same sector are more likely than changes to a new sector. On the other hand, public

administration and mining exhibit the lowest labor mobility.[13] After twelve months, only four out of ten construction workers hold the same job, in contrast to nine out of ten public administration employees.

The heterogeneity in sectoral transitions between formal wage jobs suggests that average labor mobility measures conceal important differences among various types of workers. In the United States, for example, people who change jobs or sectors are more likely to be unemployed in the future compared to those who stay in same job, resulting in an unequal distribution of employment changes in the population (Murphy & Topel, 1987). In fact, sector mobility is not homogeneous among workers: 39% of individuals that were formally employed at least sixty months between 2005 and 2016[14] stayed in the same economic sector - and 23% in the same job- throughout their employment history, while 33% were employed in three or more sectors (Figure 2).

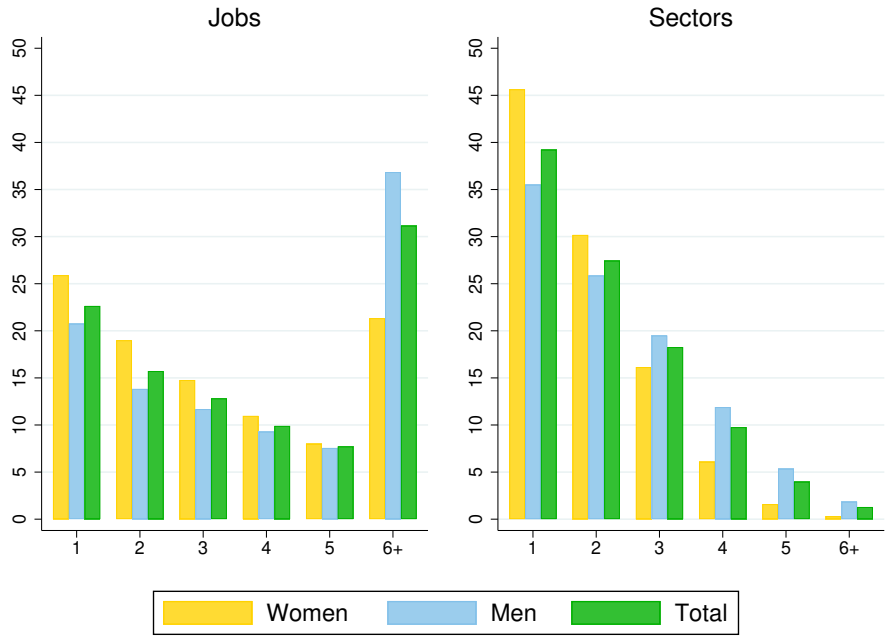
There are also significant differences by gender and age: while 46% of women stay in the same sector throughout the period, this is true for only 36% of men. Similarly, while 45% of women have had at most two jobs, 54% of men have had four or more. Regardless of their gender, over our sample younger workers change jobs more frequently than older individuals (result not shown in the figure), which is consistent with previous findings (such as Topel & Ward (1992)), who show that two thirds of job-changes occur during the first ten years of the working-life. In the case of Chile, for example, we find that the share of women who held at least four formal wage jobs between 2005 and 2016 was 20% for women older than 55 years old, whereas it is almost twice as much in women between 35 and 54 years (39%), and three times as much for women below 34 years old (58%).

[13]Despite using a different methodology and sample period, our results are similar to those of Reinecke & Ferrada (2005).

[14]Lifting this restriction would add workers with a short working history to the sample, potentially biasing the results towards a greater job stability.

Figure 2

Number of Jobs and Sectors in Formal Employees Work History
(share of formal employees working for at least sixty months between 2005 and 2016)

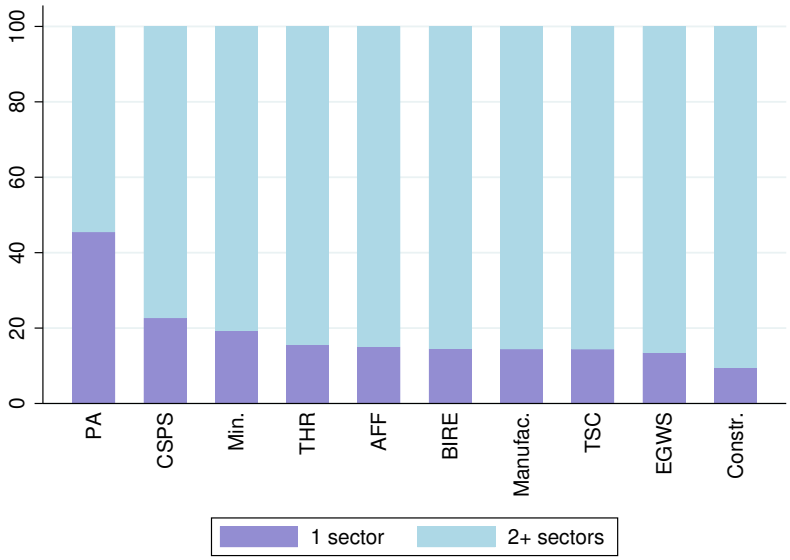


(*) This figures only considers workers that were formally employed at least sixty months.
Source: Authors' calculations based on data from the Chilean IRS and Register Office.

Additionally, the number of sectors in which workers participate varies significantly depending on the economic activity in which they are actually employed: while almost half of the employees in public administration have been employed exclusively in this sector, this is true for only 10% of construction workers (Figure 3). Although a more detailed analysis of the determinants of sectoral attachment is beyond the scope of this article, these significant differences could be linked to the different characteristics of the occupations and skill requirements across sectors.

Figure 3

Number of Sectors in Formal Employees Work History by Sector (*)
(share of formal employees working for at least sixty months between 2005 and 2016)



(*) Economic activities are ordered according to the share of employees working exclusively in one sector. The following is the list of acronyms and abbreviations used: Agriculture, forestry, and fishing (AFF); Mining and quarrying (Min.); Manufacturing (Manufac.); Energy, gas, and water supply (EGWS); Construction (Constr.); Trade, hotels, and restaurants (THR); Transport, storage, and communication (TSC); Banking, insurance, and real estate (BIRE); Public Administration (PA); and Community, social, and personal services (CSPS). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

The observed heterogeneity in sectoral labor mobility can be associated with differences in the accumulation of sector-specific experience (whether by specific human capital, job ladders, networking, individual preferences, among others), which is imperfectly transferable across economic activities (Neal, 1995; Dix-Carneiro, 2014). Differences in sector-specificity suggest that the costs of sectoral transitions, both pecuniary and non-pecuniary, are heterogeneous. For example, the model from Dix-Carneiro (2014) estimates that the costs of changing sectors in Brazil are widely distributed according to specific characteristics of the population (the ratio between average costs and average individual annual income range from 1.4 to 2.7).

Therefore, sector switching is probably more frequent in jobs that require less specific knowledge. This may be the case of sectors that are intensive in occupations that only require general skills or where the set of tasks does not vary significantly across sectors.[15] In contrast, for jobs that require very specific skills, sectoral transitions can

[15]The direction of causality can go the other way: workers in highly mobile jobs have less incentives

be very costly and, therefore, less frequent.

Table 1 presents a matrix of sectoral transitions for all workers that move between formal wage jobs, regardless of the length of the transition. This analysis shows that, considering all transitions, the main destination sector is personal services (one out of four transitions), suggesting that, besides its size, this industry covers a wide array of occupations that mostly require general skills. This is consistent with evidence for the United States, where services has become the main destination sector (Lee & Wolpin, 2006).

In most sectors, the most likely destination for workers that change jobs is to remain in the same sector. This is especially true for sectors as construction and agriculture where more than half of job changes occur within sector. On the other hand, workers that change jobs in mining, utilities, banking, and public administration are more likely to find formal employment in a new sector. These patterns are similar to those in Bjelland et al. (2011), who using data for the US also find the prevalence of transitions along the diagonal, particularly in the case of construction.

to invest in specific human capital, as it increases their costs of changing jobs.

Table 1

Sectoral Transitions between Formal Wage Jobs by Previous Sector (*)
(share of formal employees with a new job by previous sector, average 2005-2016)

Previous sector	**Next sector of formal employment**									
	AFF	Min.	Manufac.	EWGS	Constr.	THR	TSC	BIRE	PA	CSPS
AFF	**51**	1	9	0	10	13	3	1	1	10
Min.	9	18	9	1	**24**	10	7	1	1	19
Manufac.	10	1	**25**	0	18	18	5	1	1	19
EWGS	7	1	10	12	21	12	8	2	2	**24**
Constr.	5	1	9	0	**61**	7	3	1	1	13
THR	8	0	10	0	9	**36**	5	2	2	26
TSC	5	1	8	1	11	15	**33**	2	1	22
BIRE	5	0	6	0	9	17	6	23	2	**31**
PA	7	1	6	0	8	12	4	2	20	**40**
CSPS	4	1	8	0	11	18	6	3	3	**45**
Total	**12**	**1**	**11**	**0**	**22**	**18**	**6**	**2**	**2**	**25**

(*) Main destination industry is highlighted in red for each sector. Acronyms and abbreviations used are the following: Agriculture, forestry, and fishing (AFF); Mining and quarrying (Min.); Manufacturing (Manufac.); Energy, gas, and water supply (EGWS); Construction (Constr.); Trade, hotels, and restaurants (THR); Transport, storage, and communication (TSC); Banking, insurance, and real estate (BIRE); Public Administration (PA); and Community, social, and personal services (CSPS). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

IV Consequences of Formal Job Transitions

As documented in the previous section, most job transitions between formal wage jobs in Chile are indirect. This section describes the length of these transitions, distinguishing by origin sectors and different types of workers. We then study how the likelihood of moving to a new sector varies with the length of the transitions, and conclude by characterizing the relationship between wage changes and job transitions.

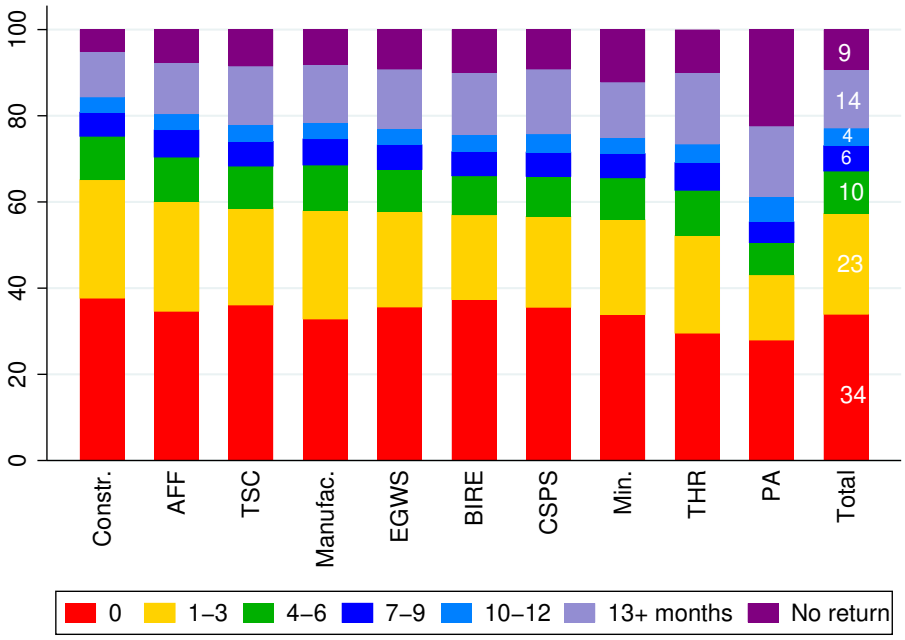
IV.1 Non-Employment Spells between Formal Wage Jobs

Transitions between formal wage jobs take about seven months, on average. However, most job changes take less time: while 34% of transitions are job-to-job, 57% take up to one quarter (Figure 4). Transitions vary across different types of jobs: unsurprisingly, workers that change jobs from sectors with higher labor mobility, such as

construction and agriculture find a formal employment faster than workers that change jobs in other sectors. While only a little more than 10% of workers in those sectors take more than a year to find a new formal job, that figure is about 50% higher for job separations in sectors such as trade or public administration.

Figure 4

Non-Employment Duration of Transitions between Formal Wage Jobs
by Previous Sector (*)
(share of workers returning to the formal employment after t months, average 2005-2016)



(*) Sectors are ordered according to the share of workers that find a new formal wage job within three months of being separated. Average length of non-employment transition between formal wage jobs for total formal employment is in parenthesis. The following is the list of acronyms and abbreviations used: Agriculture, forestry, and fishing (AFF); Mining and quarrying (Min.); Manufacturing (Manufac.); Energy, gas, and water supply (EGWS); Construction (Constr.); Trade, hotels, and restaurants (THR); Transport, storage, and communication (TSC); Banking, insurance, and real estate (BIRE); Public Administration (PA); and Community, social, and personal services (CSPS). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

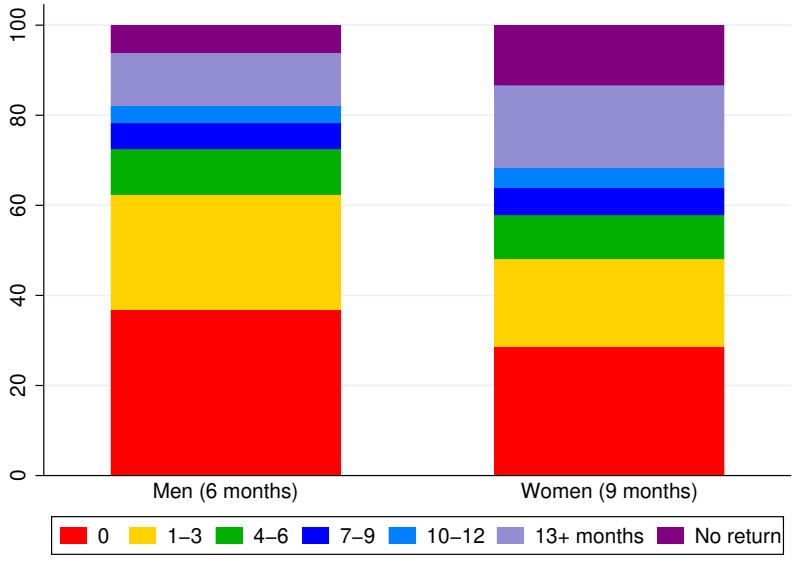
On average, female transitions take longer: women and men find a new job after 9 and 6 months, respectively (Figure 5). While two thirds of job transitions for men take place within a quarter, this only holds for 48% of female transitions. Only three out of every ten job transitions of female workers are direct, compared to 37% for men, which is consistent with the evidence provided by Bachmann (2005), who document that job-to-

job transitions are less frequent for female workers. Additionally, we observe that 13% of women that separate from a job are not reemployed during our sample period, while this is true for only 6% of men. These differences are statistically significant (Table B.1 of the appendix). According to Royalty (1998), this pattern can be mostly explained by the behavior of less educated female workers, while there are no significant differences for highly educated women, an hypothesis we cannot test in our data given the lack of information on education. A similar behavior than the one we found for Chile holds for the Czech Republic, where women who go through a period of unemployment are less likely to find employment again than men, regardless of marital status (Sorm & Terrell, 2000).

Differences in transitions for men and women are robust across sectors (Figure A.1). Public administration is the only sector where the share of job-to-job transitions is similar for both genders.

Figure 5

Non-Employment Duration of Transitions between Formal Wage Jobs by Gender (*)
(share of workers returning to the formal employment after t months, average 2005-2016)



(*) Average non-employment duration between formal wage jobs for total formal employment by gender in parenthesis. Source: Authors' calculations based on data from the Chilean IRS and Register Office.

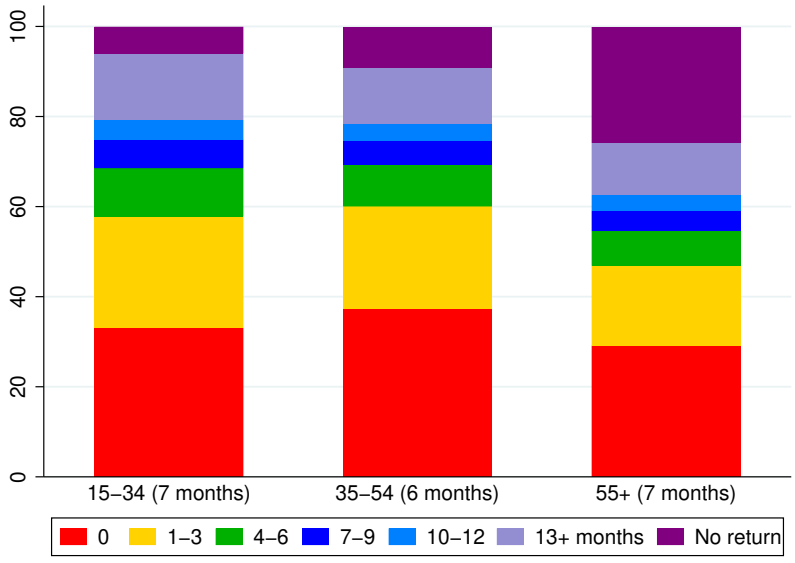
In terms of age, job-to-job transitions are more frequent for workers aged 35 to 54 years old (Figure 6 and Table B.2). This differs from the findings in Topel & Ward (1992), where job-to-job transitions are more common among younger workers.

Additionally, as expected, the share of workers who never return to formal employment after a separation grows monotonously with age: only 6% of individuals younger than 35 years old who leave a job are not reemployed during our sample, while the figure rises to 9% for those between 35 and 54 years old and to more than 26% for workers older than 55 years old.

The relationship between age and transition length seen in the aggregate holds for all sectors but mining and public administration (Figure A.2). While in mining, the frequency of job-to-job transitions is nearly identical for young and middle-aged workers, direct transitions are increasing in age in the public sector. In addition, one out of two workers in the oldest wage group does not return to formal employment after leaving a job in public administration, more than double the share seen in other sectors.

Figure 6

Non-Employment Duration of Transitions between Formal Wage Jobs
by Age Group (*)
(share of workers returning to the formal employment after t months, average 2005-2016)



(*) Age is measured when a formal wage job ends (not when a new one starts). Average non-employment duration between formal wage jobs for total formal employment by age group in parenthesis. Source: Authors' calculations based on data from the Chilean IRS and Register Office.

Finally, we find that the proportion of job-to-job transitions is increasing across income quintiles:[16] while only a quarter of job transitions in the lowest quintiles are

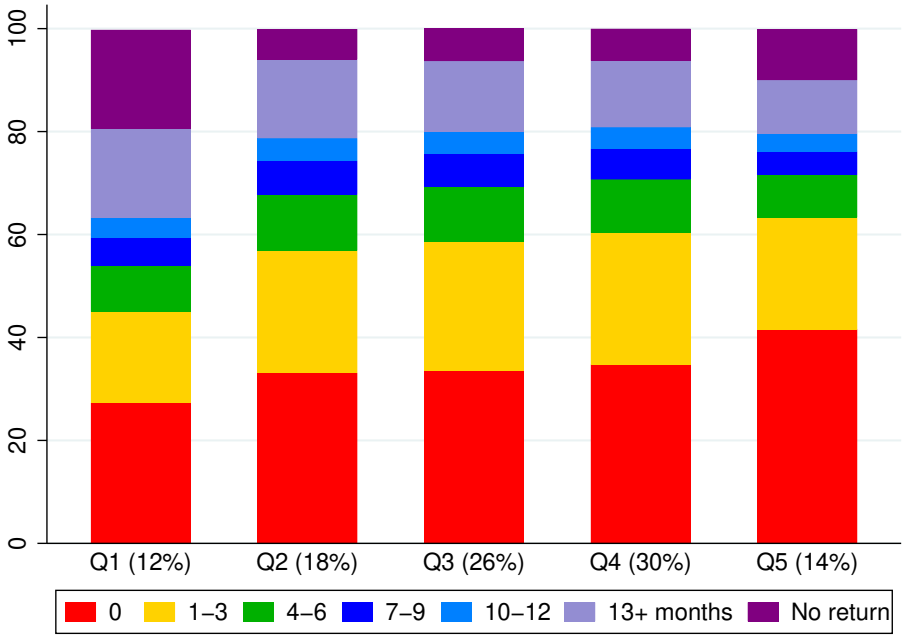
[16]We calculate a measure of medium-term labor income quintiles as follows: for each year a worker

direct, in the highest income quintile the share is 42% (Figure 7). Similarly, the length of transitions between formal wage jobs is decreasing in income. The lowest income quintile has the highest share of workers who do not return to formal employment after leaving a job. The number of transitions, on the other hand, is not strictly monotonic on income. While workers in the two extremes of the income distribution change jobs less frequently, more than half of all transitions in the sample comes from workers in the third and fourth income quintiles.

While the share of job-to-job transitions is increasing in income for almost all sectors, two industries stand out (Figure A.3). In agriculture, job-to-job transitions are roughly invariant in income, except for the first quintile. In utilities, job-to-job transitions only differ for the fifth quintile.

Figure 7

Non-Employment Duration of Transitions between Formal Wage Jobs
by Lifetime Labor Earnings Quintiles (*)
(share of workers returning to the formal employment after t months, average 2005-2016)



(*) Income quintiles are defined using information for the workers's complete wage history. Income is lowest in the first quintile. Quintiles are ordered increasingly by labor earnings during the entire working history. The share of total formal employment transitions for each quintile is presented in parenthesis. Source: Authors' calculations based on data from the Chilean IRS and Register Office.

is employed, we rank his average monthly wage relative to all other individuals that had a formal wage job that year. To define quintiles, we calculate the average ranking of each worker across all years.

IV.2 Probabilities of Job Transitions Between Sectors

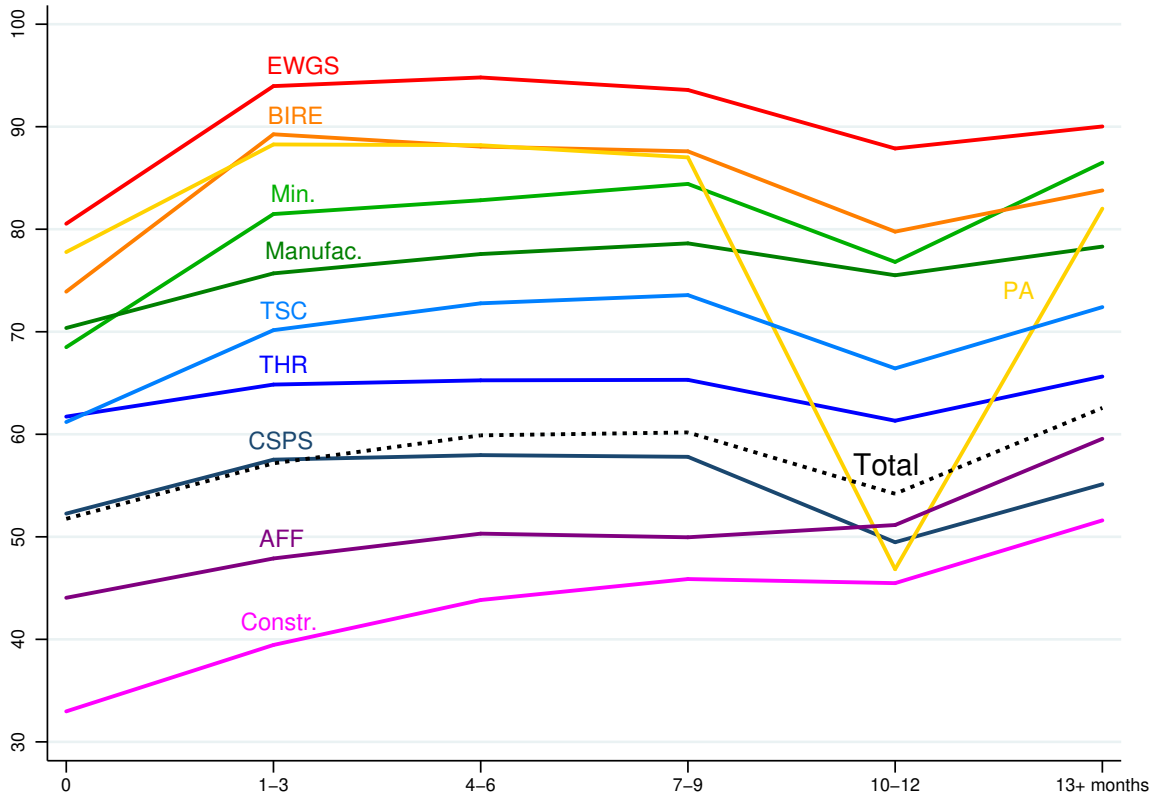
We now characterize how the frequency of sector changes varies with the length of the job transition process. Conceptually, it seems likely that most workers that leave their job start the search process looking for a new match in the same sector, to take advantage of their sector-specific skills and connections. However, if their search efforts are not successful, they might start looking for offers in new sectors (Greenaway et al., 2000).

In line with this hypothesis, the overall frequency of sector-switching is increasing on the length of the transition process (Figure 8).[17] This is similar to previous evidence for the U.S. (Shin & Shin, 2008). In fact, in all sectors but construction, after twelve months without formal employment most workers that find a formal wage job do it in a new sector. In the case of small sectors in terms of total employment, such as utilities, banking, and mining, most employees that leave their jobs switch to another sector, regardless of the length of the transition. These results are in line with those in previous sections, reinforcing the idea that transitions across sectors are less costly for workers employed in economic activities that require less specific skills.

[17] Sporadic jobs may be behind the seasonal spike in same sector rehiring for all sectors after ten to twelve months without a formal employment.

Figure 8

Between-Sectors Transitions of Formal Employment
by Previous Sector and Non-Employment Duration (*)
(share of workers switching sectors after t months without formal employment,
average 2005-2016)



(*) The following is the list of acronyms and abbreviations used: Agriculture, forestry, and fishing (AFF); Mining and quarrying (Min.); Manufacturing (Manufac.); Energy, gas, and water supply (EGWS); Construction (Constr.); Trade, hotels, and restaurants (THR); Transport, storage, and communication (TSC); Banking, insurance, and real estate (BIRE); Public Administration (PA); and Community, social, and personal services (CSPS). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

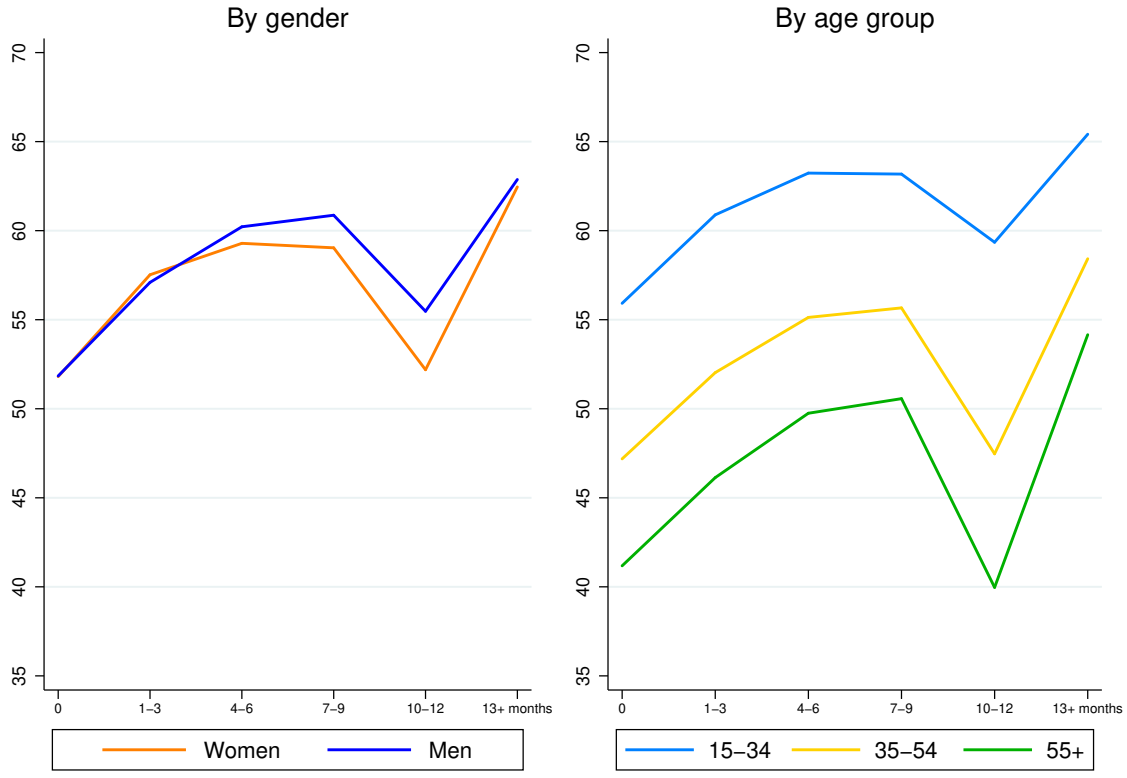
Gender differences are relatively minor (Figure 9). Men and women have statistically identical probabilities of switching sectors after job-to-job transitions, although after the fourth month men are significantly more likely to move to another sector than women (Table B.3).

Differences across age groups are consistent with the notion that switching costs are smaller for less experienced workers: young workers below 35 years old change sectors more frequently, regardless of the length of the transition (Table B.4). These findings

are similar to those of Moscarini & Thomsson (2007), who report a negative correlation between age of workers and mobility between sectors, as well as to the theoretical predictions of search models such as that of Neal (1995).

Figure 9

Between-Sectors Transitions of Formal Employment by Non-Employment Duration (*)
(share of workers switching sectors after t months without formal employment,
average 2005-2016)



(*) Age is measured when a formal wage job ends (not when a new one starts). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

IV.3 Wage Implication of Job Transitions

It seems likely that direct (job-to-job) transitions, which can be seen as a reasonable proxy for voluntary job changes, reflect transitions in which the worker moves up the job ladder and experiences wage gains (Moscarini & Postel-Vinay, 2018). On the other hand, indirect transitions, that involve spending some time outside the formal labor market, might be more closely associated with involuntary displacements and can be more costly in terms of wages, as the worker has to search for offers.

Conceptually, the relationship between reemployment wage and the duration of job transitions is not obvious. On the one hand, reservation wages may decrease over time, as human capital depreciates and the worker depletes his consumption buffers, such as unemployment insurance, severance package, and personal savings. This would imply that reemployment wages should be decreasing in the length of the transition period (Ljungqvist & Sargent, 2008). On the other hand, transitions lengths are endogenous, and workers with higher reservation wages may have to search longer to find an acceptable offer, since they have better outside options. Due to selection effects, reemployment wages would be higher the longer the transition process (McCall, 1970).

The international evidence on the relationship between re-entry wages and the duration of non-employment is mixed. Evidence for Portugal (Carneiro & Portugal, 2006), Great Britain (Gregory & Jukes, 2001), and a panel of european countries (García-Pérez & Rebollo, 2005) favors the first hypothesis, with wages in the new job decreasing with the length of the transition. However, reemployment wages in France are higher for longer unemployment spells (Bender et al., 2002), while in Germany and the United States there is no clear pattern (Bender et al., 2002; Abbring et al., 2002).

As discussed earlier, job transitions involving movements across sectors might be more costly than those within a sector, as sector-specific experience can be imperfectly transferable, generating barriers to labor mobility associated to the loss of skills (Dix-Carneiro, 2014). Previous literature has presented evidence consistent with this hypothesis for Portugal (Carneiro & Portugal, 2006), Mexico (Kaplan et al., 2005), and the United States (Addison & Portugal, 1989; Jacobson et al., 1993; Carrington, 1993; Stevens, 1997).

Job-to-job transitions within formal employment in Chile are on average associated with wage gains, regardless of whether they occur within or between sectors:[18] compared to exit wages, job-to-job changes within the same sector are associated to a 10% wage increase, while direct transitions across sectors are associated with an increase of 16% (Figure 10), a figure that is larger than the evidence provided by Hyatt & McEntarfer (2012), who focus in job transitions during the Great Recession. Using data from Denmark, Jinkins & Morin (2018) show that a better employer-employee match quality explains 44% of the wage gains associated with job-to-job transitions.

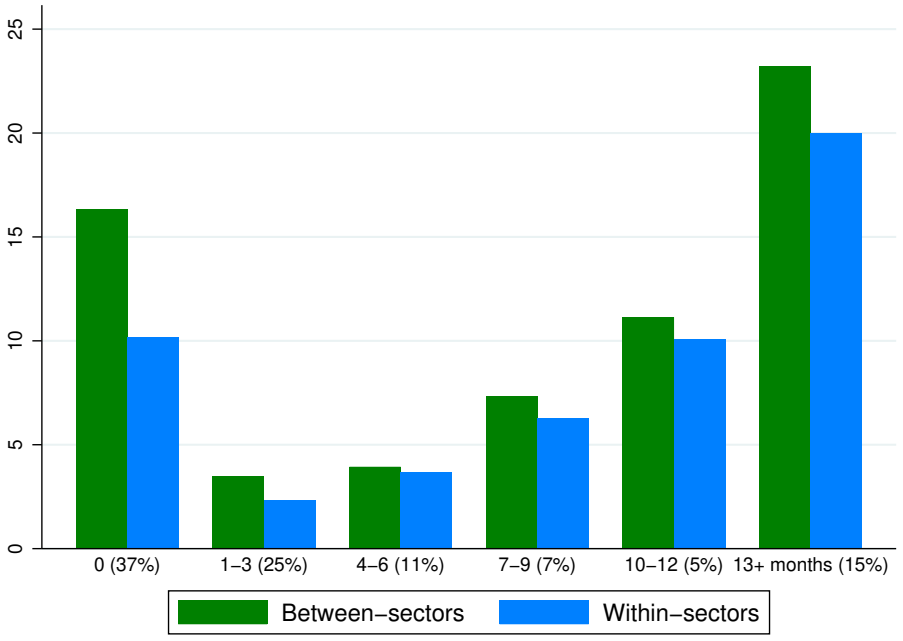
Although job-to-job transitions between formal employment are on average related

[18]Artuc et al. (2015) find different results using aggregate data of 56 countries provided by the United Nations. They estimate that the cost of moving between sectors in Chile is 3.5 times the average annual wage of the economy, lower than the average of developing countries.

to larger wage gains than indirect changes,[19] wage gains in indirect transitions are increasing in the duration of the non-employment spell.[20] This result appears to be consistent with a selection effect, where workers with higher reservation wages wait until they can find an acceptable offer. Transitions between-sectors are associated with significantly higher wage gains than those of within-sector changes (Table B.5). Although this result seems to go against the notion that transitions across sectors can be costly due to the loss of sector-specific skills, a closer look at the data reveals some new facts.

Figure 10

Wage Changes of Transitions between Formal Wage Jobs
by Non-Employment Duration (*)
(% change relative to last wage after t months without formal employment,
average 2005-2016)



(*) The share of workers that are reemployed after t months is in parenthesis. Source: Authors' calculations based on data from the Chilean IRS and Register Office.

Results at the aggregate level conceal relevant heterogeneity between sectors and

[19]Despite using a different methodology, Albagli et al. (2018a), with the same database, also conclude that wage gains of job-to-job transitions between formal wage jobs are greater than those of indirect transitions.

[20]When analyzing these results, it is important to bear in mind that our data does not include information on hours worked, so we cannot analyze whether income gains are driven by variations in hourly wages or in hours worked.

worker characteristics. To illustrate the differences at the sectoral level, we select the four largest sectors in terms of employment, which cover more than three quarters of formal employment: personal services, trade, construction, and manufacturing (Figure 11). Personal services, the largest sector, replicates the aggregate results: job-to-job changes are associated with wage increases; wage gains in transitions across sectors are larger, and wage gains are increasing in the transition length. In contrast, wage gains for workers that leave trade and find a new job after seven to twelve months are not significantly higher than of those who stay in this sector (Table B.6). In construction and manufacturing, wage gains for workers that leave those sectors are significantly lower than wage gains from those who stay, regardless of the duration of the transition. Moreover, in both sectors, workers who move to a new sector suffer wage losses when transitions between formal wage jobs take from one to twelve months.

These sectoral differences in the wage implications of job transitions are consistent with the hypothesis that workers can have sector-specific skills that are not completely transferable across economic activities. In effect, reemployment wages seem to be higher for workers leaving sectors which are more intensive in occupations that require general skills, as in the case of sales workers in trade or clerical support employees in personal services. In contrast, individuals displaced from sectors that are more skill-specific, such as manufacturing and construction, can face wage costs when moving to a new sector.

Figure 11

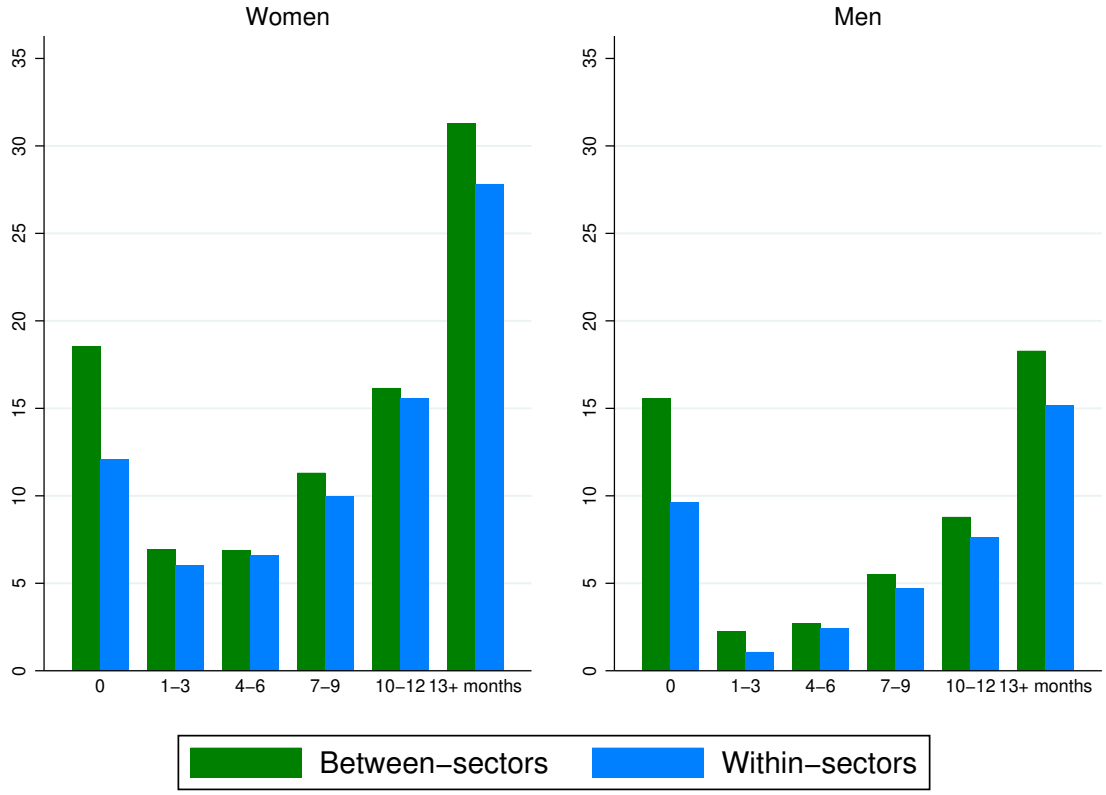
Wage Changes of Transitions between Formal Wage Jobs
by Non-Employment Duration for Selected Previous Sectors (*)
(% change relative to last wage after t months without formal employment,
average 2005-2016)

(*) In parenthesis is the share of formal employment for each selected sector. Source: Authors' calculations based on data from the Chilean IRS and Register Office.

While qualitative patterns are similar across genders, there are differences in magnitudes (Figure 12). Female workers that change formal wage jobs face significantly higher wage gains than men, regardless of whether the transition is within or between-sectors, job-to-job or indirect (Table B.7). For example, women that find a new formal employment in the same sector after seven to nine months experience wage gains of 10%, whereas for men the average gain is 5%. These results are opposed to the evidence found by Walker (2013) and Song et al. (2012). Higher reservation wages for women in Chile can drive this finding: as female participation in the workforce in the country is still more sporadic than the participation of men, women might only accept formal wage job offers that are sufficiently attractive.

Figure 12

Wage Changes of Transitions between Formal Wage Jobs
by Non-Employment Duration and Gender
(% change relative to last wage after t months without formal employment,
average 2005-2016)



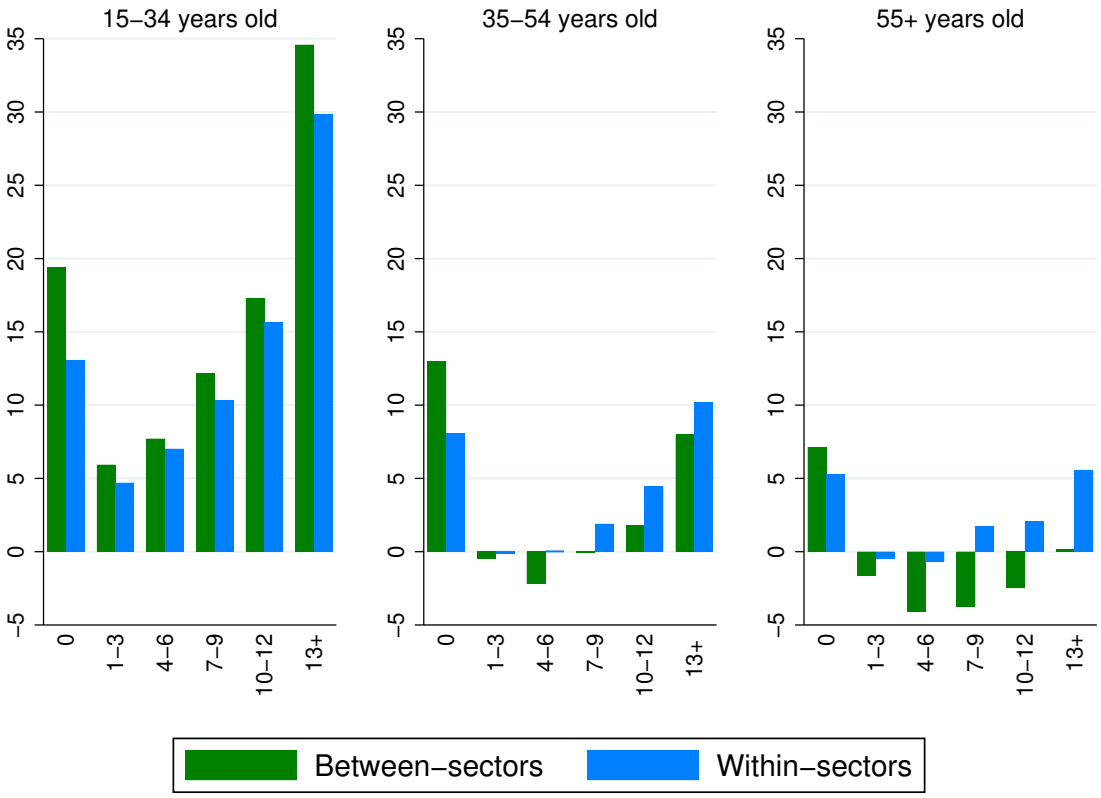
Source: Authors' calculations based on data from the Chilean IRS and Register Office.

Finally, wage patterns by age groups are in line with the previous evidence (Figure 13). First, job-to-job transitions between-sectors lead to significantly higher wage gains than job changes within-sectors for all age groups, although these gains are decreasing in age (Table B.8). However, wage changes associated to indirect transitions vary by age. Average wage gains are always positive and increasing in the duration of the non-employment spell for workers younger than 35 years. On the other hand, after six months without formal employment, workers aged 35 to 54 years suffer wage losses once they are reemployed in a different sector. For these workers, transitions between-sectors appear to be more costly than those within-sectors, which supports the hypothesis that more experienced workers have accumulated more skills that are

imperfectly transferable across economic activities. This is even more noticeable for workers aged older than 55 years, for whom switching sectors is more expensive than staying in the same sector and who suffer wage losses on average when job transitions are indirect. This evidence is similar that of Farber (2015), who finds that the older the worker the greater the wage loss associated with job changes, concluding that there is an important relation between wage changes and seniority in the previous employment, of Walker (2013), and of the literature about job displacements (Jacobson et al., 1993; Song et al., 2012).

Figure 13

Wage Changes of Transitions between Formal Wage Jobs
by Non-Employment Duration and Age Groups (*)
(% change relative to last wage after t months without formal employment,
average 2005-2016)



(*) Age is measured when a formal wage job ends (not when a new one starts). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

V Conclusions and main results

We use a matched employee-employer census data of formal employment in Chile between 2005 and 2016 to characterize job mobility across sectors. On average, 32% of workers leave their current job within a year. Job transitions are more frequent in sectors like construction and agriculture, while jobs in mining or public administration are significantly more stable. We find that, on average, workers that change jobs are equally likely to do so within their initial sector than moving to a new sector, but that there is significant heterogeneity in the degree of job stability across different types of workers.

We find that job transitions are typically not related to wage losses, suggesting that the importance of job-specific and sector-specific human capital is limited for most workers. Indeed, we document that between-sectors transitions of formal employment have greater wage gains than changes within-sectors and that those gains are increasing in the duration of the non-employment spell. This is especially the case of sectors associated with tasks that require a more broad set of skills, as personal services. However, workers in sectors that require specific skills, such as construction and manufacturing, face wage losses when switching sectors through indirect transitions. In addition, on average, women get higher wage gains than men when changing formal wage jobs. In terms of age, younger workers that change jobs experience higher wage gains, while job transitions of older employees are more costly.

References

Aaronson, D., Rissman, E., & Sullivan, D. (2004). Can Sectoral Reallocation Explain the Jobless Recovery? *Economic Perspectives*, *Q*(II), 36–39.

Abbring, J. H., Van Den Berg, G. J., & Van Ours, J. C. (2002). The Anatomy of Unemployment Dynamics. *European Economic Review*, *46*(10), 1785–1824.

Addison, J. T., & Portugal, P. (1989). Job Displacement, Relative Wage Changes, and Duration of Unemployment. *Journal of Labor Economics*, *7*(3), 281–302.

Albagli, E., Aldunate, R., Canales, M., Contreras, G., de la Huerta, C., Tapia, M., & Wlasiuk, J. M. (2017a). Respuestas Cíclicas de los Salarios en Chile: Una Mirada a la Evidencia Micro. *Mimeo*, *Monetary Policy Report March 2017*, Central Bank of Chile.

Albagli, E., Canales, M., Syverson, M., C. Tapia, & Wlasiuk, J. M. (2018a). The Microstructure of Labor Reallocation: Job Transitions and Productivity Gaps. *Mimeo*, Central Bank of Chile.

Albagli, E., Chovar, A., Luttini, E., Naudon, A., & Tapia, M. (2017b). Labor Market Flows: Evidence from Chile Using Micro Data from Administrative Tax Records. *Working Paper*, *812*, Central Bank of Chile.

Albagli, E., Contreras, G., Tapia, M., & Wlasiuk, J. M. (2018b). Wage Cyclicality of New and Continuing Jobs. *Mimeo*, *Central Bank of Chile*.

Artuc, E., Lederman, D., & Porto, G. (2015). A Mapping of Labour Mobility Costs in the Developing World. *Journal of International Economics*, *95*(1), 28–41.

Bachmann, R. (2005). Labour Market Dynamics in Germany: Hirings, Separations, and Job-to-Job Transitions over the Business Cycle. *SFB Discussion Paper*, *45*.

Bachmann, R., & Burda, M. (2010). Sectoral Transformation, Turbulence and Labor Market Dynamics in Germany. *German Economic Review*, *11*, 37–59.

Bender, S., Dustmann, C., Margolis, D., & Meghir, C. (2002). Worker Displacement in France and Germany. In *Losing Work, Moving on: International Perspectives on Worker Displacement.* W.E. Upjohn Institute for Employment Research.

Benguria, F., Saffie, F., & Urzúa, S. (2018). The Transmission of Commodity Price Super-Cycles. *Working Paper*, *24560*, National Bureau of Economic Research.

Bjelland, M., Fallick, B., Haltiwanger, J., & McEntarfer, E. (2011). Employer-to-employer flows in the united states: Estimates using linked employer-employee data. *Journal of Business & Economic Statistics*, *29*(4), 493–505.

Carneiro, A. J. M., & Portugal, P. (2006). Earnings Losses of Displaced Workers: Evidence from a Matched Employer-Employee Data Set. *IZA Discussion Papers*, *2289*, Institute of Labor Economics.

Carrington, W. J. (1993). Wage Losses for Displaced Workers: Is it Really the Firm that Matters? *Journal of Human Resources*, *28*(3), 435–462.

Dix-Carneiro, R. (2014). Trade Liberalization and Labor Market Dynamics. *Econometrica*, *82*(3), 825–885.

Fallick, B., & Fleischman, C. (2004). Employer-to-Employer Flows in the U.S. Labor Market: The Complete Picture of Gross Worker Flows. *Finance and Economics Discussion Series*, *34*, Board of Governors of the Federal Reserve System (US).

Farber, H. S. (2015). Job Loss in the Great Recession and its Aftermath: US Evidence from the Displaced Workers Survey. *Working Paper*, *21216*, National Bureau of Economic Research.

García, M., & Naudon, A. (2012). Dinámica Laboral en Chile. *Working Paper*, *659*, Central Bank of Chile.

García-Pérez, J., & Rebollo, Y. (2005). Wage Changes Through Job Mobility in Europe: A Multinomial Endogenous Switching Approach. *Labour Economics*, *12*(4), 531–555.

Garonna, P., & Sica, F. G. (2000). Intersectoral Labour Reallocations and Unemployment in Italy. *Labour Economics*, *7*(6), 711–728.

Golan, A., Lane, J., & McEntarfer, E. (2007). The Dynamics of Worker Reallocation Within and Across Industries. *Economica*, *74*(293), 1–20.

Greenaway, D., Upward, R., & Wright, P. (2000). Sectoral Transformation and Labour–Market Flows. *Oxford Review of Economic Policy*, *16*(3), 57–75.

Gregory, M., & Jukes, R. (2001). Unemployment and Subsequent Earnings: Estimating Scarring Among British Men: 1984–94. *Economic Journal*, *111*(475), 607–625.

Haltiwanger, J., Hyatt, H., & McEntarfer, E. (2018). Who Moves Up the Job Ladder? *Journal of Labor Economics*, *36*(S1), S301–S336.

Hyatt, H., & McEntarfer, E. (2012). Job-to-Job Flows in the Great Recession. *American Economic Review*, *102*(3), 580–83.

Jacobson, L. S., LaLonde, R., & Sullivan, D. (1993). Earnings Losses of Displaced Workers. *American Economic Review*, *83*(4), 685–709.

Jinkins, D., & Morin, A. (2018). Job-to-job transitions, sorting, and wage growth. *Labour Economics*, *55*, 300–327.

Kaplan, D. S., Martínez Gonzalez, G., Robertson, R., Menezes-Filho, N., & Arias, O. (2005). What Happens to Wages after Displacement? *Economía*, *5*(2), 197–242.

Lee, D., & Wolpin, K. I. (2006). Intersectoral Labor Mobility and the Growth of the Service Sector. *Econometrica*, *74*(1), 1–46.

Ljungqvist, L., & Sargent, T. J. (2008). Two Questions about European Unemployment. *Econometrica*, *76*(1), 1–29.

McCall, J. J. (1970). Economics of Information and Job Search. *Quarterly Journal of Economics*, *84*(1), 113–126.

Moscarini, G., & Postel-Vinay, F. (2018). The Cyclical Job Ladder. *Annual Review of Economics*, *10*, 164–188.

Moscarini, G., & Thomsson, K. (2007). Occupational and Job Mobility in the US. *Scandinavian Journal of Economics*, *109*(4), 807–836.

Murphy, K. M., & Topel, R. H. (1987). The Evolution of Unemployment in the United States: 1968–1985. *NBER Macroeconomics Annual*, *2*, 11–58.

Neal, D. (1995). Industry–Specific Human Capital: Evidence from Displaced Workers. *Journal of Labor Economics*, *13*(4), 653–677.

Reinecke, G., & Ferrada, C. (2005). Creación y Destrucción de Empleo en Chile: Análisis de Datos Longitudinales de la ACHS. *Working Paper*, International Labour Organization (ILO).

Royalty, A. (1998). Job-to-job and job-to-nonemployment turnover by gender and education level. *Journal of Labor Economics*, *16*(2), 392–433.

Shin, D., & Shin, K. (2008). Fluctuations of Unemployment and Inter-and Intra-Sectoral Reallocations of Workers. *International Economic Journal*, *22*(2), 231–251.

Song, J., Topa, G., Violante, G., & Sahin, A. (2012). *Measuring Mismatch in the US Labor Market* (2012 Meeting Papers No. 973). Society for Economic Dynamics.

Sorm, V., & Terrell, K. (2000). Sectoral Restructuring and Labour Mobility: A Comparative Look at the Czech Republic. *Journal of Comparative Economics*, *28*(3), 431–455.

Stevens, A. H. (1997). Persistent Effects of Job Displacement: The Importance of Multiple Job Losses. *Journal of Labor Economics*, *15*(1, Part 1), 165–188.

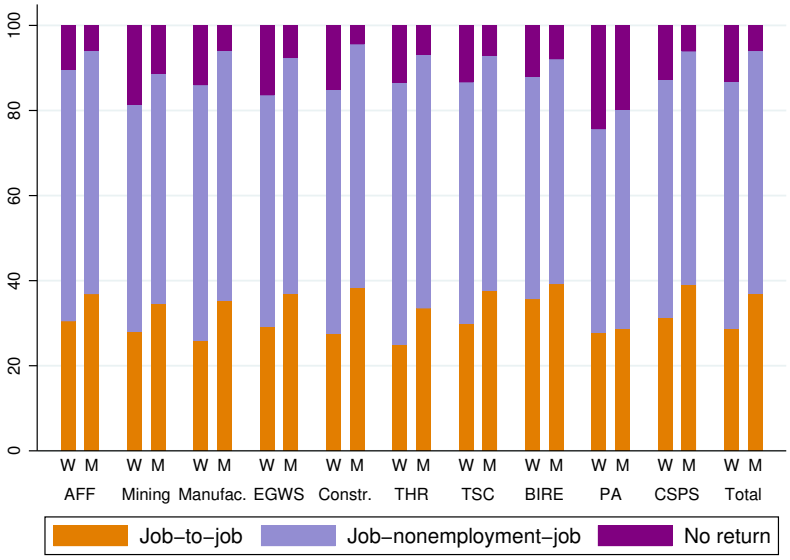
Topel, R., & Ward, M. (1992). Job mobility and the careers of young men. *Quarterly Journal of Economics*, *107*(2), 439–479.

Walker, W. R. (2013). The Transitional Costs of Sectoral Reallocation: Evidence from the Clean Air Act and the Workforce. *Quarterly Journal of Economics*, *128*(4), 1787–1835.

Appendix A: Additional Figures

Figure A.1

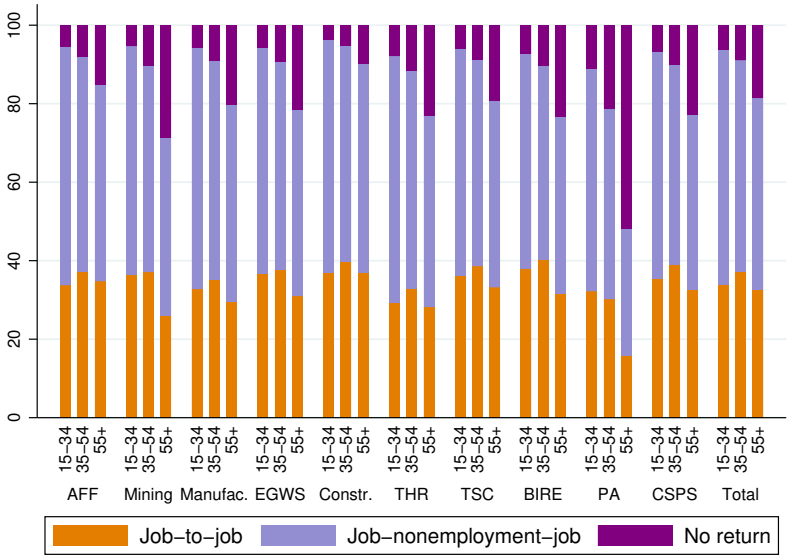
Non-Employment Duration of Transitions between Formal Wage Jobs
by Gender and Previous Sector (*)
(share of workers returning to the formal employment after t months, average 2005-2016)



(*) The following is the list of acronyms and abbreviations used: Agriculture, forestry, and fishing (AFF); Mining and quarrying (Min.); Manufacturing (Manufac.); Energy, gas, and water supply (EGWS); Construction (Constr.); Trade, hotels, and restaurants (THR); Transport, storage, and communication (TSC); Banking, insurance, and real estate (BIRE); Public Administration (PA); and Community, social, and personal services (CSPS). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

Figure A.2

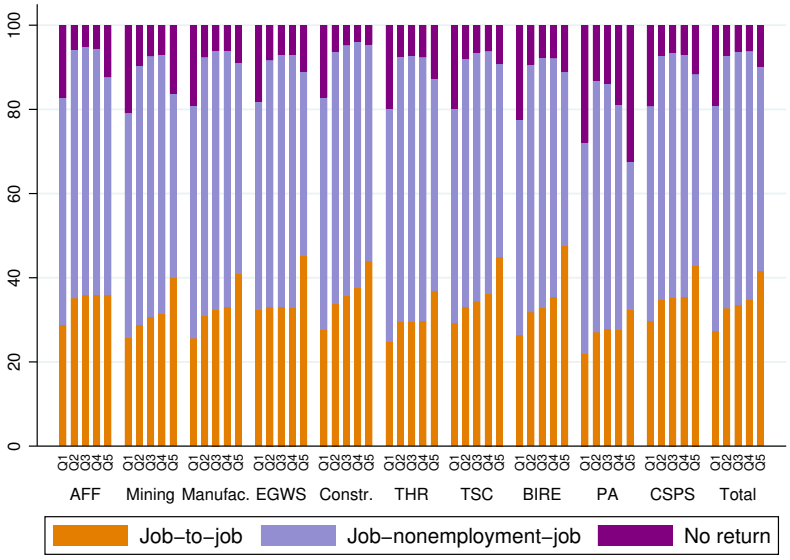
Non-Employment Duration of Transitions between Formal Wage Jobs
by Age Group and Previous Sector (*)
(share of workers returning to the formal employment after t months, average 2005-2016)



(*) Age is measured when a formal wage job ends (not when a new one starts). The following is the list of acronyms and abbreviations used: Agriculture, forestry, and fishing (AFF); Mining and quarrying (Min.); Manufacturing (Manufac.); Energy, gas, and water supply (EGWS); Construction (Constr.); Trade, hotels, and restaurants (THR); Transport, storage, and communication (TSC); Banking, insurance, and real estate (BIRE); Public Administration (PA); and Community, social, and personal services (CSPS). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

Figure A.3

Non-Employment Duration of Transitions between Formal Wage Jobs
by Lifetime Labor Earnings Quintiles and Previous Sector (*)
(share of workers returning to the formal employment after t months, average 2005-2016)



(*) Quintiles are ordered increasingly by labor earnings during the entire working history. The following is the list of acronyms and abbreviations used: Agriculture, forestry, and fishing (AFF); Mining and quarrying (Min.); Manufacturing (Manufac.); Energy, gas, and water supply (EGWS); Construction (Constr.); Trade, hotels, and restaurants (THR); Transport, storage, and communication (TSC); Banking, insurance, and real estate (BIRE); Public Administration (PA); and Community, social, and personal services (CSPS). Source: Authors' calculations based on data from the Chilean IRS and Register Office.

Appendix B: Tests for Differences in Means

Table B.1

Differences between Genders in the Distribution
of Transitions between Formal Wage Jobs by Non-Employment Duration
(differences in the share of workers returning to the formal employment after t months,
average 2005-2016)

Months	**Women/Men**
0	-8.1 ***
1-3	-6.0 ***
4-6	-0.4 **
7-9	0.4 ***
10-12	0.5 ***
13+	6.6 ***
NR	7.3 ***

Note: $*\ p < 0.05$; $**\ p < 0.01$; $***\ p < 0.001$, NR: No Return. Source: Authors' calculations based on the Chilean IRS and Register Office data.

Table B.2

Differences between Age Groups in the Distribution of
Transitions between Formal Wage Jobs by Non-Employment Duration
(differences in the share of workers returning to the formal employment after t months,
average 2005-2016)

Months	**15-34 / 35-54**	**15-34 /55+**	**35-54 /55+**
0	-4.3 ***	3.8 ***	8.1 ***
1-3	2.1 ***	6.9 ***	4.8 ***
4-6	1.4 ***	3.0 ***	1.6 ***
7-9	1.1 ***	1.9 ***	0.7 ***
10-12	0.5 ***	0.8 ***	0.2 ***
13+	2.4 ***	3.3 ***	0.9 ***
NR	-3.1 ***	-19.8 ***	-16.7 ***

Note: $*\ p < 0.05$; $**\ p < 0.01$; $***\ p < 0.001$, NR: No Return. Source: Authors' calculations based on the Chilean IRS and Register Office data.

Table B.3

Differences between Genders in the Probability of Between-Sectors Transitions of Formal Employment by Non-Employment Duration
(differences in the share of workers switching sectors after t months without formal employment,average 2005-2016)

Months	**Women/Men**
0	0.0
1-3	0.3 *
4-6	-0.9 ***
7-9	-1.3 ***
10-12	-2.0 ***
13+	-0.6 ***

Note: $* \ p < 0.05$; $* * \ p < 0.01$; $* * * \ p < 0.001$. Source: Authors' calculations based on the Chilean IRS and Register Office data.

Table B.4

Differences between Age Groups in the Probability of Between-Sectors Transitions of Formal Employment by Non-Employment Duration
(differences in the share of workers switching sectors after t months without formal employment, average 2005-2016)

Months	**(15-34 / 35-54)**	**(15-34 /55+)**	**(35-54 /55+)**
0	8.7 ***	14.7 ***	6.0 ***
1-3	8.9 ***	14.8 ***	5.9 ***
4-6	8.1 ***	13.6 ***	5.5 ***
7-9	7.5 ***	12.6 ***	5.1 ***
10-12	7.7 ***	13.1 ***	5.4 ***
13+	6.1 ***	9.9 ***	3.8 ***

Note: $* \ p < 0.05$; $* * \ p < 0.01$; $* * * \ p < 0.001$. Source: Authors' calculations based on the Chilean IRS and Register Office data.

Table B.5

Differences in Wage Changes of Transitions
between Formal Wage Jobs by Non-Employment Duration
(differences in percentage change relative to last wage after t months
without formal employment, average 2005-16)

	0	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between	-6.2 ***	-1.2 ***	-0.3	-1.0 ***	-1.1 **	-3.2 ***
Directs/Indirects						
Within-sector	-	7.9 ***	6.5 ***	3.9 ***	0.1	-9.8 ***
Between-sectors	-	12.9 ***	12.4 ***	9.0 ***	5.2 ***	-6.7 ***
Compared with 1-3 months						
Within-sector	-	-	-1.4 ***	-4.0 ***	-7.8 ***	-17.7 ***
Between-sectors	-	-	-0.5	-3.8 ***	-7.7 ***	-19.8 ***

Note: $* \ p < 0.05$; $* * \ p < 0.01$; $* * * \ p < 0.001$. Source: Authors' calculations based on the Chilean IRS and Register Office data.

Table B.6

Differences in Wage Changes of Transitions between Formal Wage Jobs
by Non-Employment Duration for Selected Previous Sectors
(differences in percentage change relative to last wage after t months
without formal employment, average 2005-16)

Community, social, and personal services	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between Directs/Indirects	-16.5 ***	-12.2 ***	-11.8 ***	-11.5 ***	-11.9 ***	-14.4 ***
Within-sector	-	6.9 ***	5.1 ***	0.5	-4.0 ***	-20.6 ***
Between-sectors	-	11.2 ***	9.8 ***	5.4 ***	0.6	-18.5 ***
Compared with 1-3 months						
Within-sector	-	-	-1.9 ***	-6.5 ***	-10.9 ***	-27.7 ***
Between-sectors	-	-	-1.4 **	-5.8 ***	-10.6 ***	-29.9 ***
Trade, hotels, and restaurants	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between Directs/Indirects	-1.6 ***	3.1 ***	2.8 ***	0.4	0.1	-4.7 ***
Within-sector	-	7.9 ***	7.6 ***	5.2 ***	0.9	-8.5 ***
Between-sectors	-	12.5 ***	12.1 ***	7.3 ***	2.6 ***	-11.5 ***
Compared with 1-3 months						
Within-sector	-	-	-0.3	-2.6 ***	-6.9 ***	-16.4 ***
Between-sectors	-	-	-0.5	-5.2 ***	-9.9 ***	-24.2 ***
Construction	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between Directs/Indirects	3.6 ***	8.1 ***	8.7 ***	8.4 ***	7.8 ***	6.3 ***
Within-sector	-	8.1 ***	5.6 ***	3.3 ***	1.2	-3.6 ***
Between-sectors	-	12.6 ***	10.7 ***	8.1 ***	5.4 ***	-0.8
Compared with 1-3 months						
Within-sector	-	-	-2.5 ***	-4.7 ***	-6.8 ***	-11.7 ***
Between-sectors	-	-	-1.9 ***	-4.5 ***	-7.2 ***	-13.5 ***
Manufacturing	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between Directs/Indirects	2.8 ***	4.4 ***	4.2 ***	4.7 ***	4.9 ***	3.7 ***
Within-sector	-	12.2 ***	12.9 ***	10.2 ***	7.0 ***	-0.5
Between-sectors	-	13.7 ***	14.3 ***	12.1 ***	9.0 ***	1.1
Compared with 1-3 months						
Within-sector	-	-	0.8	-2.0 ***	-5.2 ***	-12.0 ***
Between-sectors	-	-	0.6	-1.7 ***	-4.7 ***	-12.7 ***

Note: $*$ $p < 0.05$; $**$ $p < 0.01$; $***$ $p < 0.001$. Source: Authors' calculations based on the Chilean IRS and Register Office data.

Table B.7

Differences between Genders in Wage Changes of Transitions between Formal Wage Jobs by Non-Employment Duration (differences in percentage change relative to last wage after t months without formal employment, average 2005-16)

Women	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between	-6.4 ***	-0.9 **	-0.3	-1.4 **	-0.6	-3.5 ***
Directs/Indirects						
Within-sector	-	6.1 ***	5.5 ***	2.1 ***	-3.5 ***	-15.7 ***
Between-sectors	-	11.6 ***	11.7 ***	7.2 ***	2.4 ***	-12.7 ***
Compared with 1-3 months						
Within-sector	-	-	-0.6	-3.9 ***	-9.5 ***	-21.8 ***
Between-sectors	-	-	0.1	-4.4 ***	-9.2 ***	-24.4 ***
Men	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between	-5.9 ***	-1.2 ***	-0.3	-0.8 **	-1.2 **	-3.1 ***
Directs/Indirects						
Within-sector	-	8.6 ***	7.2 ***	4.9 ***	2.0 ***	-5.5 ***
Between-sectors	-	13.3 ***	12.8 ***	10.0 ***	6.8 ***	-2.5 *
Compared with 1-3 months						
Within-sector	-	-	-1.3 ***	-3.6 ***	-6.6 ***	-14.0 ***
Between-sectors	-	-	-0.5	-3.3 ***	-6.5 ***	-16.0 ***
Women/Men	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within-sector	2.5 ***	4.9 ***	4.2 ***	5.3 ***	7.9 ***	12.7 ***
Between-sectors	3 ***	4.7 ***	4.1 ***	5.8 ***	7.4 ***	13 ***

Note: $* \ p < 0.05$; $* * \ p < 0.01$; $* * * \ p < 0.001$. Source: Authors' calculations based on the Chilean IRS and Register Office data.

Table B.8

Differences between Age Groups in Wage Changes of Transitions between Formal Wage Jobs by Non-Employment Duration (differences in percentage change relative to last wage after t months without formal employment, average 2005-16)

15-34 years old	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between	-6.3 ***	-1.2 ***	-0.7 *	-1.8 ***	-1.6 ***	-4.7 ***
Directs/Indirects						
Within-sector	-	8.4 ***	6.1 ***	2.7 ***	-2.6 ***	-16.7 ***
Between-sectors	-	13.5 ***	11.7 ***	7.2 ***	2.1 **	-15.0 ***
Compared with 1-3 months						
Within-sector	-	-	-2.3 ***	-5.6 ***	-10.9 ***	-25.1 ***
Between-sectors	-	-	-1.8 ***	-6.2 ***	-11.3 ***	-28.7 ***
35-54 years old	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between	-4.9 ***	0.3	2.2 ***	2.0 ***	2.7 ***	2.2 ***
Directs/Indirects						
Within-sector	-	8.2 ***	8.0 ***	6.2 ***	3.6 ***	-2.1 **
Between-sectors	-	13.5 ***	15.2 ***	13.1 ***	11.2 ***	5.1 ***
Compared with 1-3 months						
Within-sector	-	-	-0.2	-2.1 ***	-4.6 ***	-10.3 ***
Between-sectors	-	-	1.7 ***	-0.4	-2.3 ***	-8.5 ***
55+ years old	**0**	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
Within/Between	-1.9 ***	1.2 ***	3.4 ***	5.5 ***	4.5 ***	5.4 ***
Directs/Indirects						
Within-sector	-	5.7 ***	5.9 ***	3.6 ***	3.2 ***	-0.3
Between-sectors	-	8.8 ***	11.2 ***	10.9 ***	9.6 ***	7.0 ***
Compared with 1-3 months						
Within-sector	-	-	0.2	-2.2 ***	-2.5 ***	-6.0 ***
Between-sectors	-	-	2.4 ***	2.1 ***	0.9	-1.9 **
	0	**1-3**	**4-6**	**7-9**	**10-12**	**13+ months**
15-34/35-54						
Within-sector	5.0 ***	4.9 ***	7.0 ***	8.4 ***	11.2 ***	19.7 ***
Between-sectors	6.4 ***	6.4 ***	9.9 ***	12.3 ***	15.5 ***	26.6 ***
15-34/55+						
Within-sector	7.8 ***	5.2 ***	7.7 ***	8.6 ***	13.6 ***	24.3 ***
Between-sectors	12.2 ***	7.6 ***	11.8 ***	15.9 ***	19.8 ***	34.4 ***
35-54/55+						
Within-sector	2.8 ***	0.3	0.7 *	0.2	2.4 ***	4.6 ***
Between-sectors	5.9 ***	1.1 ***	1.9 ***	3.7 ***	4.3 ***	7.8 ***

Note: $*$ $p < 0.05$; $**$ $p < 0.01$; $***$ $p < 0.001$. Source: Authors' calculations based on the Chilean IRS and Register Office data.

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