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The Self-Employment Option in Rigid Labor Markets: An Empirical Investigation

Joaquin Garcia-Cabo and Rocio Madera

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Abstract

This paper studies selection into and returns to self-employment in labor markets with stringent employment protection. Using Spanish administrative panel data, we characterize self-employment dynamics in the presence of rigidities that affect workers' outside options. We document the negative selection into self-employment when workers enter from unemployment, and the pro-cyclicality of the decision. We identify career heterogeneity in the data and estimate a rich life-cycle income process. The self-employed face shocks with smaller variances but lower returns compared to fixed-term workers—the prevalent contract out of unemployment. These facts call for a revision of active labor market policies in place.

JEL Classi ication: J24, J64, E32

Keywords: Self-employment, business cycles, unemployment, employment protection

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1 Introduction

This paper studies selection into and returns to self-employment in labor markets with stringent employment protection. On average, self-employment currently makes up 14 percent of total employment for OECD countries, and has a higher share at 20 percent over the past 30 years in European countries such as Italy, Portugal, and Spain. These countries are also characterized by *rigid* labor markets, meaning with a high degree of employment protection resulting in low turnover. In these markets, highly protected paid-employment contracts are perceived as a low-risk, long-lasting option. Yet the frictions associated with stronger regulations result in higher and more volatile unemployment compared to flexible labor markets. Moreover, mandatory dismissal costs make firms reluctant to offer stable paid-employment. In the context of high unemployment and scarce stable employment opportunities, the joint dynamics of self-employment together with rigid labor markets have raised the attention of policy-makers. Recent work recognizes that self-employment can become a stepping-stone towards protected jobs and facilitate job flexibility (Baker *et al.*, 2018). These benefits play a larger role in rigid labor markets. Still, most of the current studies on self-employment are based on data from countries with flexible labor markets (Poschke, 2013; Humphries, 2018). In the context of rigid labor markets, selection into self-employment and the returns to the self-employment option are still open and timely questions.

We analyze the determinants of becoming self-employed, as well as the life-cycle returns to spending time as a self-employed worker, using workers' complete labor histories from Spanish social security records. The Spanish labor market is an ideal case study for this question. During the Great Recession, spanish unemployment spiked above 25 percent and youth unemployment surpassed 50 percent. Additionally, stringent employment protection has segmented job opportunities: 30 percent of workers are employed under unstable, fixed-term contracts, and the rest under nearly permanent contracts. Our dataset, known as *Muestra Continua de Vidas Laborales* (MCVL), has three key characteristics: (1) the administrative nature of the data, (2) the large sample size, and (3) the longitudinal design. The sample encompasses 4% of Spanish taxpayers from 2005 to 2015 (approximately 1.2

million individuals), reducing the sample-size limitations of surveys, as well as measurement error. For those workers in the sample, the full working history is included, even prior to 2005. The longitudinal design allows us to follow the working histories of all individuals over a long time period, including two different recessions of different magnitudes and duration (1992-93 and the Great Recession) and the highest growth decade in Spain's recent history. Most importantly, the richness of the dataset in labor market outcomes and demographics allows us to control for observed characteristics and deal with unobserved heterogeneity.

The novelty of our analysis relies on complementing a cyclical analysis of self-employment with a life-cycle analysis, to illustrate the dynamics stemming from different job alternatives in rigid labor markets. Previous studies have distinguished between two forces of cyclical selection into self-employment: *pull* and *push* forces (Carrasco, 1999). During economic expansions, the more favorable business conditions *pull* workers into self-employment. In recessions, the high and persistent unemployment *pushes* workers to switch to self-employment instead of searching for longer periods. Notice that pull and push factors move in opposite directions over the business cycle. In rigid labor markets, this distinction does not provide a complete picture of selection into self-employment. Policy-related forces, such as the degree of employment protection, affect workers' outside option, and hence, entry and exit. To account for these effects, we complement the business cycle analysis with a life-cycle study. With regard to self-employment, we characterize entrants across time, survival, returns to general labor market experience and tenure, and through the lens of an age-dependent heterogeneous income process as in Karahan and Ozkan (2013), lifetime income dynamics.

Our main findings can be summarized as follows. First, the probability of becoming self-employed is pro-cyclical: recessions and higher unemployment rates negatively impact the decision to enter self-employment for both unemployed and salaried workers. Second, the probability of entering self-employment from unemployment is lower for female, low-educated, young, and previously fixed-term employees. The probability increases in previous earnings and tenure before the dismissal and if the worker is not receiving unemployment insurance. Third, the probability of entering self-employment from paid-employment decreases on current wage and tenure, and it increases if the worker is employed under a fixed-term

or a part-time contract, or if he is working in a services-related industry (i.e., food and accommodation, household services). Fourth, survival rates in self-employment are higher during expansions and for workers who did not experience unemployment before starting their business than for those who were unemployed. These workers enjoy higher earnings and longer spells in self-employment, compared to those entering from unemployment. Fifth, when returning to paid-employment, workers who spent a predominant share of their careers before age 40 in self-employment earn less than recurrent fixed-term workers. This is due to both lower returns to general experience and tenure for workers in the former group. However, the results of estimating a rich model of lifetime income dynamics suggest that the latter set of workers experience more volatile permanent and transitory shocks due to the high turnover of fixed-term contracts.

The results of our analysis suggest that government promotion policies for self-employment should take into account workers' heterogeneity and the role of skill accumulation. Most self-employment promotion policies in place have subsidies for those in unemployment, while these funds are not available for workers in paid-employment, thus inducing negative selection. The higher risk of failure into self-employment for young and unemployed workers calls for a revision of these policies and the design of complementary active labor market policies, including training policies for the unemployed and self-employed. The evidence presented in this paper can be used to discipline structural models that aim at studying alternative self-employment reforms. In separate work, we analyze the role of the timing of subsidy collection in alleviating negative selection into self-employment and incentivizing the creation of long-lasting businesses which foster employment. The evidence in this paper is not exclusive to Southern Europe: new challenges brought up by the Great Recession and the gig economy have introduced new types of short-term, non-stable jobs and reduced worker turnover in countries such as the United States and the United Kingdom (Amaral, 2011).

This paper is organized as follows. Section 2 covers the related literature. Section 3 describes the data; in particular, the definition of self-employment and variable description. Section 4 contains an analysis of the flows between paid-employment, self-employment, and unemployment. Section 5 describes the multivariate analysis and probit estimation to under-

stand observed heterogeneity. Section 6 contains a survival analysis in self-employment and estimates of heterogeneous lifetime earnings profiles based on self-employment experience at different stages in workers' careers to characterize unobserved heterogeneity. Finally, Section 7 concludes and contains the agenda for future research.

2 Related Literature

The rapid increase in self-employment has centered the attention of recent empirical research. A number of papers study the causes and consequences of self-employed workers using longitudinal data. Evans and Leighton (1989) document the process of selection into self-employment on the United States using National Longitudinal Survey of Young Men (NLS) data on young white men between 1966 and 1985. This paper is among the first to document the characteristics of transitioning into self-employment over the life cycle using longitudinal data. However, given the characteristics of the data, the sample is reduced to a specific subset of the workforce who are interviewed bi-annually - reducing the frequency of observations in the data. Sraer *et al.* (2014) study the effect of a large-scale French reform that relaxed barriers of entry to self-employment. In particular, the government started providing a generous downside insurance for individuals starting a small business. The authors document that post-reform entry growth is larger by more than 12 percentage points in industries in which small firms are prevalent at creation. Poschke (2013) provides empirical evidence on the choice of becoming self-employed. Using National Longitudinal Survey of Youth data (NLSY79), he documents that the relationship between entrepreneurship and ability is U-shaped: entrepreneurship is higher for people with high or low levels of education. More recently, Humphries (2018) using panel data from Sweden studies the labor market outcomes of self-employed workers over the life cycle. However, these papers abstract from incorporating the role of business cycles and cyclicality of unemployment into their analysis.

Several papers have attempted to study the relationship between self-employment and unemployment. Alba-Ramirez (1994) uses U.S. data (CPS) and Spanish data from the Working and Living Conditions Survey (ECVT) in 1985. He finds that for both the United

States and Spain, the probability of becoming self-employed increases with unemployment duration. The drawbacks of these databases include a small sample size and its survey condition, which increases response bias and measurement error. Additionally, his study is carried out during a particularly high but low-volatility unemployment episode for Spain, which prevents him from observing differences in transitions over time. Carrasco (1999) also studies the role of the business cycle also for the Spanish experience using survey data from the Spanish Continuous Family Expenditure Survey (Encuesta Continua de Presupuestos Familiares) from 1985 to 1991. This paper provides an extensive analysis on the probability of entering self-employment for individuals with different characteristics and takes into account the economy aggregate state. Its main drawback is that the survey is limited to male household heads, who are only observed for, at most, up to eight quarters, which generates attrition in entry and exit between paid-employment, self-employment, and unemployment. In contrast, in this paper we use a large longitudinal data-set from the Spanish social security records to shed light on the determinants of becoming self-employed. The panel features the labor histories of 4% of the Spanish workforce for more than three decades. The panel dimension allows us to fully characterize the dynamics of the transition into self-employment and to study the characteristics of workers who enter self-employment during recessions and booms while controlling for observable characteristics and unobserved heterogeneity from their previous working history. The sample size also allows us to distinguish between the dynamics of males and females, and of different cohorts. We start by describing the data in the next section.

3 Data

The Spanish Social Security Administration Data

We use data from the Spanish social security administration (SSSA). The dataset is known as *Muestra Continua de Vidas Laborales* (MCVL). It consists of a 4% representative sample of Spanish individuals affiliated with the SSSA for a given year, whether they are employed, unemployed, or retired. The sample size is about 1.2 million individuals per year, which

reduces the sample-size limitations of surveys. The sample is selected in 2004 and has a longitudinal and historical structure: for every individual in the 2004 sample, we can observe her full working history from the first day of affiliation until 2015, starting from 1980.[1] Regarding the population and content of the data, the MCVL samples from individuals who were affiliated at least one day during the reference year. It excludes individuals with provided health insurance or noncontributory subsidies, as well as individuals without any connection to the SSSA. The dataset contains monthly wage data back to 1980 with an entry for each job spell the worker has experienced as a salaried or self-employed worker, as well as each nonemployment spell that involves government benefits. For each working spell, the dataset also reports the start and end date of the contract, the type of contract, and the cause of dismissal, among other relevant variables about the worker's labor history, firm, and job characteristics.[2] For the case of the nonemployment spells, we observe the associated unemployment benefits and pension amount.

Sample

We focus on prime-age workers (25 to 55 years old) to avoid capturing atypical behavior at the beginning or end of the career. In the interest of data quality, our preferred time period of analysis is 1990 to 2015, as spell and income information is occasionally missing prior to 1990. Our baseline sample considers affiliated individuals in all industries. Other samples are considered in the robustness analysis that will be discussed later.

3.1 Definition of main variables

The source of the information in the MCVL is the actual contracts signed between firms and workers. The information in the dataset regarding job characteristics is therefore very detailed and of high quality. This allows us to perform an analysis with a large number

[1] Technically, the histories are available since the 1960s, but most of the variables of interest started being reported in 1980. Because of data limitations regarding the 2004 wave, we use the 2005–15 waves to construct the longitudinal panel.

[2] These include information regarding a firm's location, size, and sector; particular worker characteristics on the contract (full or part-time, if the worker has a disability); and the worker's professional category, as described in the contract.

of individuals while controlling for their characteristics over time, in particular their labor histories, which can be determinants for the decision of becoming self-employed. Next, we summarize the variables used in the analysis, including definition, construction, and sources.

Self-employment

In order to identify the self-employment spells in the data, we use the variable *régimen de cotización* (contribution regime). This variable identifies the type of regime (salaried work or self-employment) that the spell is associated to according to the social security administration.[3] For the main analysis, we exclude workers in identified special self-employment regimes—mostly in fishing and agricultural activities—from the sample, as they may behave in a different way than the self-employed in the regular regime.[4] If a worker has more than one simultaneous job under different regimes, we classify him under salaried work or self-employment as follows. If the worker has two or more active spells within a given month, and at least one belongs to self-employment, we define his job as the one under which he has the most seniority.[5] This approach reduces the error of attributing a certain job regime to workers with a long-lasting job or entrepreneurial activity but who have a seasonal or temporary source of income from a second activity. Whenever the period of analysis is at a lower frequency than monthly, the employment status for each period corresponds to the one held in the last month of the corresponding period. For example, for quarterly analyses, we consider a worker to be self-employed in the first quarter if she was self-employed in March; for yearly analyses, the status of relevance is that of December.

[3]Most of the previous literature has relied on self-reported employment status, which creates measurement bias.

[4]Some of these workers in the agricultural sector were re-classified after 2008 as regular self-employed workers, so we will observe workers in this industry with active spells after 2008. We think that excluding self-employed workers in primary activities will miss an important part of the workforce, as important industries for the Spanish economy, such as wine production, would be included here.

[5]We have also considered defining the main job status in the case contract overlap as the job that is the main source of earnings within a month. This does not affect the sample significantly but generates job transitions that do not represent the worker's most stable job over time.

Demographics

We observe the birth date and sex of the individual. The dataset also contains information on the highest education level obtained by the worker as reported to the Census, as well as the nationality of the worker. We only keep workers with Spanish nationality in our baseline sample. Finally, there is information regarding the province and municipality where the address of the worker is located at the time of the last data extraction, as well as information on the professional category of the worker at the firm, which is a proxy for occupation. In all of our specifications, we control for a quadratic polynomial in age, as well as the sex and the cohort of the worker. We build 10 different cohorts by defining five-year windows that start in 1940 until 1989. We also control for the years of education of the worker, as provided by the MCVL (with origin from the Census). Finally, we construct a dummy for workers employed in urban areas: the dummy takes a value 1 if the municipality is bigger than 30,000 inhabitants and 0 otherwise.

Prior contract information

We use information on the worker's last spell to control for different types of heterogeneity. In particular, we use the following information regarding the last paid-employment spell:

- *Average monthly earnings:* We take the average of the monthly earnings on the quarter prior to the transition. The MCVL provides nominal monthly earnings that we deflate using the Spanish CPI with base year 2006 provided by the National Institute of Statistics (INE).

- *Tenure:* We compute tenure as the duration of the contract from the beginning to the end of the spell. We observe the exact date (day, month, and year) when the contract started and ended, as provided from the social security administration, so tenure information is extremely accurate.

- *Contract type:* Two types of contracts with different employment protection coexist in the Spanish labor market: (1) fixed-term or temporary contracts, which offer little or no protection after dismissal and have a finite duration, and (2) permanent contracts for

extremely protected jobs with firing costs that could rise to three years' worth of a worker's wages. Because permanent contracts are correlated with job security, we use information in MCVL about the contractual relationship between the worker to control for the role of job security in generating transitions between paid employment and self-employment.

- *Part-time contract:* The MCVL reports the percentage of hours of the relationship with respect to a full-time job (100% being a full-time worker), which allows us to distinguish between full- and part-time jobs. We include a dummy for part-time jobs for the cases in which a worker was employed with a contract with less than 95% full-time equivalent hours.

- *Industry:* Associated with each spell, the MCVL contains information about the three-digit level industry classification of the firm, based on the Economic Activity National Classification (CNAE). We classify industries into 12 broad groups to control for the industry in which the worker was employed prior to a transition.

Unemployment benefits

We identify unemployment benefits in the database as payments to the unemployed worker using the variable *"Tipo de relacion laboral"*. This category allows us to identify public unemployment insurance recipiency, both in duration and amount.[6]

Aggregate variables: Unemployment rate and recession dates

To understand the effect of the business cycle on the transitions to and from self-employment, we include the following two variables: national (and regional) unemployment rates and euro-area business cycle dates. We obtain the quarterly unemployment rates from the National Institute of Statistics (INE). However, this variable itself may not be controlling enough for the business cycle (Spain has has historically high unemployment, even during the 2000-06 expansion). For this reason, we classify each quarter in the data as a recession or an expansion period, using the definition of recession provided by the Centre for Economic Policy

[6] A drawback of this database is that unless the worker is a recipient of unemployment insurance, it is not possible to separately identify periods of unemployment with no benefits and nonemployment. However, our sample restrictions try to overcome this problem by considering prime-age workers who have attachment to the social security and exhibit an employment spell before and after the dismissal.

Research (CEPR). For the period studied, the CEPR committee identifies three recessions (1992:Q1–1993:Q3, 2008:Q1–2009:Q2, and 2011:Q3–2013:Q1), while the rest of the quarters are considered expansions.[7]

4 Flows into Self-Employment: The Big Picture

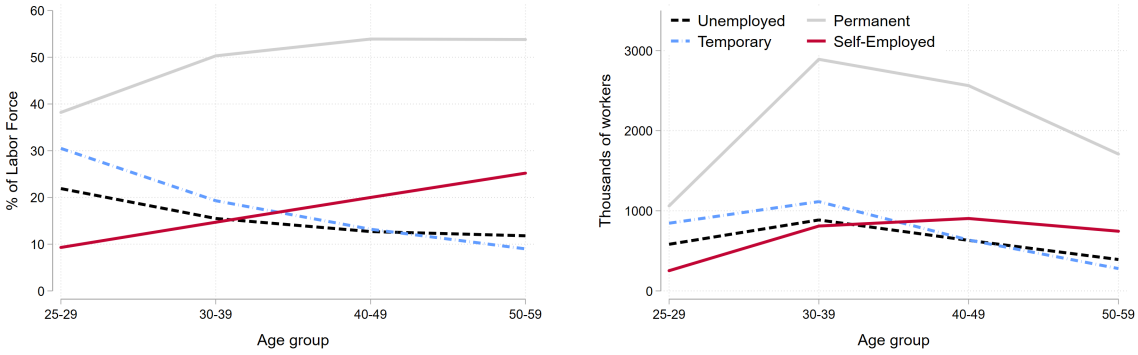
This section describes the most important attributes of the self-employment decision. We first describe the main characteristics of the self-employed. We next seek to understand how the decision to become self-employed changes over the life cycle and how it has evolved over time and with every cohort that enters the labor market. For that purpose, we will calculate the age, year, and cohort profiles of the transitions from unemployment and paid-employment to self-employment, separately.

Self-employment: Descriptive statistics

In Spain, more than 3 million workers are self-employed. The number of self-employed workers has remained fairly constant over the past three decades, and they represent an average of 20% of the labor force between 1990 and 2015, according to the National Statistics Institute (INE). The Spanish labor market has been widely studied due to its stringent duality: highly protected, *permanent* contracts coexist with short-term, unprotected fixed-term or *temporary* employment. It has also exhibited highly volatile unemployment rates that reached peaks above 25% during the Great Recession. This behavior is not exclusive to Spain: labor market duality and unemployment coexist in Southern European countries such as Italy and Portugal. In this context, the cyclical relationship between self-employment, paid-employment, and unemployment stands out as an important channel to alleviate the tensions in these labor markets.

[7]The Committee released its new findings in August 2017. Its main conclusion is that since the last trough in 2013:Q1, the euro area has been recovering at a slow but steady pace. This post-recession recovery is commensurate with that of the U.S. recovery, considering that it began later, after the double-dip European recession that followed the Global Financial Crisis

Figure 1: Distribution of workers across employment states



At first glance, we decompose the Spanish labor force into four groups of workers: unemployed, permanent, temporary, and self-employed. Figure 1 presents the rates and levels (in thousands) of these four pools of workers by age groups, as provided by the Spanish National Statistics Institute. Self-employed workers account for the same proportion and number as temporary and unemployed workers; however the literature has so far paid little attention to the self-employment option to alleviate duality and unemployment. Self-employment rates increase with age, as the prevalence of temporary employment and unemployment decreases. To better understand the characteristics of the self-employed, as well as the flows in and out of self-employment, we analyze workers' labor histories coming from Spanish social security records. We define the job status (employed, unemployed, or self-employed) at the end of each quarter, and we define transitions between different employment states between quarters. In this exercise we restrict the sample to prime-age workers (25 to 55 years old) who are either self-employed or salaried between 1990 and 2015. Tables 1 and 2 present the summary statistics of the resulting sample of workers. Self-employed workers are mainly males (65% versus 53% of salaried workers), and half of them have not completed high school. These workers have been at their own businesses for almost seven years on average, and are concentrated mainly in transportation, manufacturing and professional services. There is substantial heterogeneity within the self-employed in terms of earnings and educational attainment by industry. Self-employed workers in the energy, IT and finance, public administration and health industries are on average more educated and enjoy higher earnings. The results by industry are presented in tables 10 and 11 in the Appendix.

Table 1: Descriptive statistics (I): Self-employed vs salaried, 1990-2015

	Self-Employed			Salaried		
	Mean	Std.Dev.	Median	Mean	Std.Dev.	Median
Age	38.4	7.7	38.0	36.3	7.7	35.0
Monthly earnings	959.3	461.0	817.7	1572.2	795.6	1402.6
Tenure in years	6.7	5.6	5.3	4.1	4.4	2.6
Female (%)	34.9			47.0		

Source: MCVL-Seguridad Social, own calculations

Table 2: Descriptive statistics (II): Self-employed vs salaried, 1990-2015

Education	Self-employed	Salaried
Less than high-school (%)	49.1	42.2
High-school graduates (%)	31.7	32.0
Some college (%)	6.6	9.9
College graduates (%)	12.6	16.0
Industry	**Self-employed**	**Salaried**
Manufacturing (%)	8.8	15.0
Construction (%)	13.3	8.2
Transportation and trade (%)	32.3	21.9
Food and accommodation (%)	8.9	5.3
Real estate and professionals (%)	14.1	14.1

Source: MCVL-Seguridad Social, own calculations

Table 3 reports quarterly entry into and exit out of self-employment, and self-employment rates for different age groups with respect to the total number of self-employed within that age group for the period 1990 to 2015. Entry and exit is more common for young workers (26 to 30 years old) and plateaus around 2% between quarters for older workers for both types of transitions. From this table it seems plausible that the probability of entering and exiting is age dependent. We will study this hypothesis formally in the next sections through the use of econometric techniques.

Table 3: Self-employment quarterly entry and exit rates by age

Age Group	Entry	Exit	Rate
26-30	6.5%	3.3%	9.3%
31-35	4.3%	2.5%	12.9%
36-40	3.3%	2.1%	15.6%
41-45	2.7%	1.9%	17.4%
46-50	2.3%	1.8%	18.3%
51-55	1.9%	1.6%	19.4%

Source: MCVL-Seguridad Social, own calculations

Self-employment: Age, cohort, and cyclical dynamics

Next we show how transitions to self-employment change over the life cycle and how they evolved over time and with every cohort that has entered the labor market. For that purpose, we will calculate the age, year, and cohort profiles of the transitions from unemployment and paid-employment to self-employment, separately. Given that the frequency of the transitions decreases the shorter the time period analyzed, in this section we look at transitions between employment states at the yearly level.

Age Dynamics

Figures 2 and 3 show age profiles. The circle-markers in the left panel of Figures 2 and 3 outline the age effects net of cohort and year effects. We calculate this profile following the methodology proposed in Deaton and Paxson (1994) to separate age from both year and cohort effects while avoiding the multicollinearity between the three variables. In a nutshell, it results from regressing the series of average transitions per year-age-cohort on age, cohort, and *restricted* year dummies. The restricted year dummies are detrended and normalized to add up to zero. Intuitively, it consists of attributing any growth or decline in transitions to age and cohort effects, and it assumes that the year effects capture cyclical fluctuations that average zero over the long run. The reference group are 26-year-old workers in 1985. The resulting dummy estimates are readjusted to start at the average transition rate of the reference group.

The age profile in Figure 2 shows that the probability of entering self-employment after an unemployment spell is hump-shaped in age. Prime-age workers are more likely to start a business than younger and older workers. In contrast, the age profile in Figure 3 shows a decreasing age trend of moving into self-employment after a working spell. Notice that these differences are consistent with the push-pull view of self-employment: The most likely age to transition from unemployment is in the early 40s, when long-term unemployment is more frequently a problem. From paid-employment, it is the young that transition more into self-employment; we will discuss below that this is more likely the case in expansions, hinting at pull effects from good economic prospects. In Section 5 we use worker, firm, and job characteristics to further dissect the forces behind these findings.

Time Dynamics

Next, we turn our attention to the solid line in the left panels of Figures 2 and 3. This series corresponds to the time series. It is obtained by regressing the series of interest on age and year raw dummies, pooling year and cohort effects. Therefore, as opposed to the aforementioned adjustment, the year dummies reflect a combination of trend and cyclical components.

Two facts of these time effects are worth discussing. First, not surprisingly, there is a clear increasing time trend of becoming self-employed both from unemployment or salaried employment. This trend is more pronounced for the newly self-employed who were previously unemployed. Second, we can see a marked cyclical component, again stronger in the unemployed to self-employed case. Notice, though, that it is hard to further interpret the two facts, as cohort and year effects are confounded. For example, we do not know whether the large increase observed in the last five years of the sample is a result of the increasing tendency for each new cohort to become self-employed or if it is associated with the recovery after the Great Recession. In the next subsection, we will discuss the cohort-trend and cyclical components separately.

Cyclical Dynamics

Finally, we turn to the right panel of Figures 2 and 3. The two lines in these panels are the cohort and year dummies resulting from the regression described in the age effects discussion above and borrowed from Deaton and Paxson (1994). That is, the black-dashed lines corresponds to the pure cohort effects, without the influence of business cycles, while the red-solid lines can be identified with the cyclical component of the series. It is easy to see now that, up to the Great Recession, there was indeed an increasing trend to become self-employed from both statuses—salaried and unemployed. After 2010, however, the large increase seen in the left panels is entirely attributable to the post-recession effect in the case of transitions from unemployment. For the case in which the worker used to be salaried, we see an increasing tendency of younger working cohorts to become self-employed.

Turning to the cyclical part, the red-solid line highlights the strong correlation with GDP growth, especially in the unemployed to self-employed case. Very surprisingly, this correlation is positive, in contrast to other studies performed with US data (Alba-Ramirez, 1994). We find this result puzzling, and it will be at the core of our multivariate analysis in Section 5, as well as a motivating fact for future quantitative analysis.

Figure 2: Transitions from unemployment to self-employment

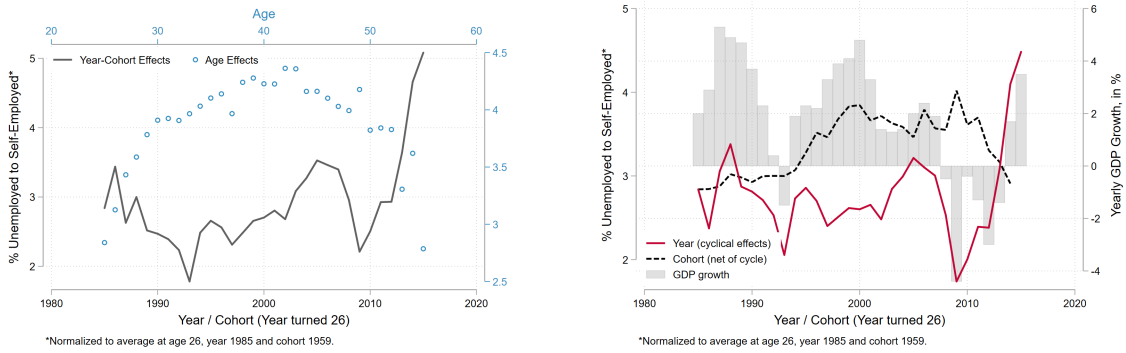
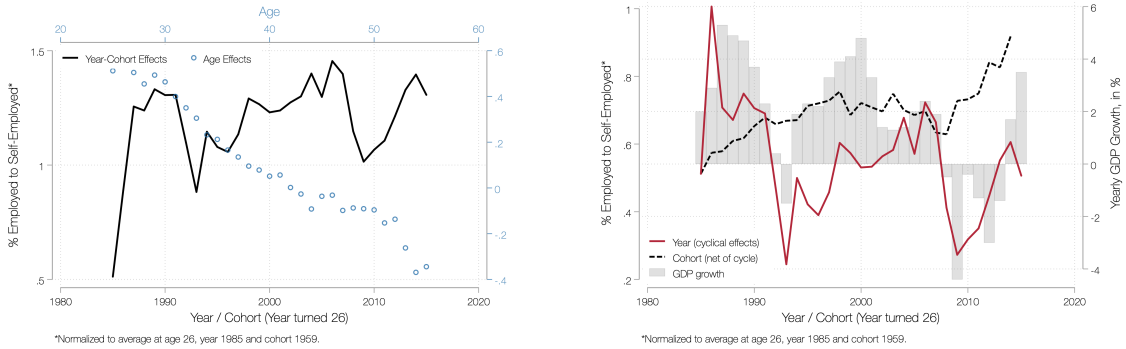


Figure 3: Transitions from paid-employment to self-employment



5 Flows into Self-Employment: Heterogeneity

To study the determinants of becoming self-employed we use a probit analysis. For this part, we collapse the panel into a quarterly dataset and record transitions between paid-employment, self-employment, and unemployment between 1990 and 2015. As explained above, we compare the employment status of the worker at the end of a given quarter q and the next one $q-1$ to identify transitions between the three states.[8] An underlying assumption of the probit regression analysis is that a worker who transitions from paid employment to self-employment does so if the expected income under self-employment is higher than the expected wage under paid employment. Similarly, it is also assumed that a worker leaves unemployment to become self-employed if the expected value of doing so is higher than the expected value of continuing to search for a wage salaried job.

Let d_i^* denote the expected income difference between self-employment and a salaried job for individual i. Then we can write d_i^* as

$$d_i^* = \beta X_i + \varepsilon_i \tag{1}$$

[8]Even though a quarterly analysis will miss any transitions that occur within the quarter, we find it is more suitable to increase the order of magnitude of the transitions and analyze the role of business cycles than a monthly analysis.

where X_i is a vector of observable individual characteristics.

The term d_i^* is not observed, but the outcome of the decision process is observed and it is summarized by a binary variable that takes a value of 1 if the worker becomes self-employed and 0 if he does not. Assuming that the error term ε_i is normally distributed, then

$$P\left(d_i^* > 0 \mid X_i\right) = F\left(\beta X_i\right) \tag{2}$$

where F is the cumulative distribution function of the standard normal.

We estimate separately the quarterly transitions to self-employment from unemployment and paid work using a binomial probit approach[9] We define job controls such as tenure or type of contract at the end of the last period, which are the relevant states to consider in the transition. In the case of unemployed workers, we use the characteristics of the last spell before being unemployed.

Probability of becoming self-employed from unemployment

We present in Table 12 in Appendix A the full probit estimates for the determinants of becoming a self-employed worker from unemployment. We analyze the results in detail below.[10] Relative to the demographic characteristics of workers, we observe that females and workers who have not completed high school education have a lower probability of transitioning from unemployment to self-employment. Not only are the flows lower, but the stock of self-employed females is smaller compared to paid-employment, as noted in Table 1. This poses an interesting puzzle. On the one hand, self-employment could, in principle, add job flexibility, helping especially women to have a stronger attachment. However, we

[9]The dependent variable takes a value of 1 if the worker becomes self-employed in q, and 0 for any other outcome. An unemployed worker at the end of quarter $q-1$ has three possible outcomes: the worker continues to be unemployed in q, the worker is a wage employee in q, or the worker is self-employed in q. Similarly, we define the transitions from paid-employment to self-employment by considering these three possible transitions: paid-employment, self-employment or unemployment. Because the focus of this paper is understanding the decision of becoming self-employed, we believe that the binomial model is sufficient to uncover the characteristics of these workers.

[10]The constant in all the specifications in the Appendix refers to males with previous employment in the primary industry, with less than six years of schooling and born between 1940 and 1944.

do not observe that in the data. On the other hand, younger cohorts are more likely to enter into self-employment compared to older cohorts of workers. One reason could be that because the higher self-employment rates are found in workers between the ages of 45 and 50, these workers have already transitioned, whereas younger cohorts exhibit lower rates in the total stock. Being a recipient of unemployment insurance decreases the probability of the transition. This is in line with the findings of Carrasco (1999) and Alba-Ramirez (1994). Relative to the characteristics of the previous employment spell, workers who were employed under temporary contracts are less likely to enter self-employment compared to permanent workers. Workers who had longer tenures, higher earnings, or a part-time contract are more likely to transition to self-employment. Having previous work experience in construction, transportation, IT, and domestic services is a positive determinant to enter self-employment. Finally, let's analyze the role of the business cycle in the transition probability. Higher national unemployment rates have a negative impact on the probability, as well as being under a CEPR recession quarter.[11]

Probability of becoming self-employed from paid work

Next we analyze the transitions from paid-work to self-employment. Complete estimation results for this specification are presented in Table 17. In line with our previous findings in transitions from unemployment, females and the low educated have a lower probability of transitioning from salaried work to self-employment. Relative to the characteristics of the current employment spell, workers who were employed under temporary contracts and part-time jobs are more likely to enter self-employment compared to permanent full-time workers. This result seems to indicate that workers in less stable jobs who face unemployment spells more frequently are more likely to avoid the labor market turmoil and start their own businesses. Aligned with this result, we find that the higher the seniority and wage of the worker, the lower the probability that he will quit his job to enter self-employment. Workers who work in urban areas are also less likely to quit their job to start their own business. Higher unemployment rates and recessions have a significant negative effect on the

[11] In an alternative specification with time effects we observe that 1992 to 1994 and the years of the Global Financial Crisis have the most negative coefficients. These results are reported in Appendix A.

probability.

To give meaning to these findings, next we present some comparison of the change in transition probabilities for workers with different covariates in Table 4. For transitions from unemployment, in this exercise we define the baseline worker as a 35-year-old male with a college degree, born between 1970 and 1974, earned €1,200 a month at his last job, is unemployed without benefits, and who was employed under a full-time permanent contract for three years as a professional before the dismissal. In the scenario of transitions from paid-employment, we consider a representative 35-year-old male, with a college degree, born between 1970 and 1974, earns €1,200 a month and has been employed under a full-time permanent contract for three years in an urban area. In both experiments, the economy has an average unemployment rate of 15% (and a high of 20%). Changes in the unemployment rate have a sizable impact on the probability of entering self-employment.[12] Moreover, entry for low-educated individuals and females is very small relative to college-educated workers.[13]

Table 4: Predicted probabilities of entering self-employment

	From U	P.P. difference	From E	P.P. difference
Baseline	2.97%	–	0.38%	–
Recession	2.56%	−0.41	0.35%	−0.03
Female	1.54%	−1.44	0.18%	−0.21
Temporary	2.40%	−0.57	0.57%	+0.19
No school	1.54%	−1.43	0.17%	−0.22
High-school	2.68%	−0.29	0.25%	−0.14
Age 25-30	2.32%	−0.66	0.39%	+0.01
High UR	2.82%	−0.15	0.37%	−0.01
UI benefits	2.71%	−0.26	–	–

In Appendix A, we conduct additional robustness checks for these findings. We estimate the model separately for different time periods.[14] In particular, Table 14 in Appendix A

[12] While in this specification we use the national unemployment rate, we have also tried an alternative specification with regional unemployment rates, with virtually no difference in our results.

[13] While the numbers seem small in magnitude, keep in mind that the unemployed average 3 million workers, and the employed account for 16 million workers.

[14] Some covariates appear with missing values as we go back in time, so we estimate the same model from 2001 onward, when all the variables should be reported by firms to the social security. By doing this, we double-check that the missing covariates are not correlated with some intrinsic characteristics that predict the transition to self-employment. Additionally, we have estimated the model separately for different cohorts;

presents these results separately for 1990–2000, 2001–15, and 2010–15. The main difference between time periods is that the probability of entering self-employment from unemployment for females, despite being lower than for males, has increased in the past decade. The effects of recessions and higher unemployment rates are significantly negative for the two main sub-periods: 1990–2000 and 2001–15. However, if we only consider the 2010–15 period, while recession quarters still have a negative effect on the transition, higher unemployment rates triggered workers into self-employment, even during recessions. This is an interesting result, because this sub-period covers the double-dip of the financial crisis and the aftermath of the Great Recession, when the unemployment rate where at a historical high, and job creation was very small. Finally, we study the relationship between previous industries and recessions by including an interaction term in the probit model. The results of this specification are presented in Tables 15 and 16 in the Appendix. While recessions negatively affect the entry for all sectors, we find that workers whose last job was in the food and accommodation services, professional activities, and education industries are barely affected during recessions. Workers previously employed in manufacturing and energy industries reduce their entry more significantly during recessions.

6 Is Self-Employment Useful to Escape Unemployment?

In this section, we study the characteristics of self-employed workers and how they affect the survival of the business. In particular, we study the transition from self-employment to unemployment and how it relates to the characteristics of the worker. We specifically show how the survival of a business is lower if a worker enters self-employment from unemployment.

We start by describing the characteristics of workers who become self-employed during the 1990–2015 period. We divide workers into two groups: those who entered self-employment from unemployment, and those who did not (either from paid-employment or directly to self-employment). Henceforth, we will refer to these two groups as origin of entry. Table 5 contains summary statistics regarding the characteristics of the self-employed based on origin

these results are available upon request, as they do not add much to the results already presented in this version of the paper.

of entry. Note that those who enter from unemployment tend to be a higher proportion of females and provide more professional and food and accommodation services relative to those who do not.

Table 5: Characteristics of self-employment workers by origin of entry

	From U	Not from U
Female	35.9%	33.5%
Less than high school	49.5%	48.7%
College	12.4%	12.8%
Age	38.7	38.1
Manufacturing	7.7%	10.0%
Construction	13.5%	13.2%
Food and accommodation	9.5%	8.2%
Real estate and professionals	15.1%	12.9%
Household services	8.9%	8.4%

We next look at the tenure distribution of self-employed workers.[15] Table 6 contains descriptive statistics on spell characteristics for self-employed workers, ranking spells by duration. Businesses of workers who join self-employment from unemployment last, on average, six years compared to more than seven years for those who do not enter from unemployment. The median age of a business for a worker who entered from unemployment is two years younger than for the rest of the workers (4.5 years versus 6.2 years, respectively).

Self-employed workers who did not experience an unemployment spell also enjoy higher monthly earnings. In particular, the average earnings for those with entry from unemployment was €923 a month compared to €1,003 for those with entry from paid-employment or joined the labor force as self-employed, 8.7% higher. Moreover, the distribution of earnings for workers entering from employment is skewed to the right compared to entering from unemployment: while the median earnings are very similar (€829 and €804, respectively), the 90% percentile is €1,578 a month for those who do not enter from unemployment and €1,175 for those who do, or 34.4% higher.

[15] In reporting the distribution of workers across tenures we restrict the years analyzed to 2005 to 2015. Because by design the self-employment spells start in 1990, we drop the first 15 years to allow distribution to converge toward the time-invariant one.

Table 6: Duration of a self-employment spell by origin of entry: 2005-2015

	Duration in years	
Spell Percentile	From U	Not from U
10%	0.5	0.9
25%	1.6	2.6
50%	4.5	6.2
75%	9.5	11.3
90%	14.4	15.9
Mean	6.2	7.4

The effect of the business cycle on which industry to enter is presented in Table 7 for the 1990–2015 period. The proportion of workers who enter manufacturing and construction falls during recessions, while those going into food and accommodation services increases. These industries become outside options for both unemployed and paid-wage workers during downturns, when opportunities to find a job are scarce and the stability of a job decreases. In addition, barriers to entry in these industries are smaller compared to manufacturing, as the specific human capital required is not high and there are few and inexpensive licenses needed to operate.

Table 7: Self-employment industry over the business cycle

	Expansion		*Recession*	
	From U	Not from U	From U	Not from U
Manufacturing	5.9%	6.8%	5.1%	5.9%
Construction	14.3%	18.0%	13.2%	12.7%
Food and accommodation	11.5%	10.3%	13.3%	12.7%
Real state and professionals	16.3%	14.7%	16.3%	16.3%
Household services	8.7%	7.9%	9.1%	9.1%

We next analyze formally the effect of different characteristics of self-employed workers to disentangle whether observables are able to predict the higher average earnings of those who join self-employment without experiencing unemployment. We perform an econometric survival analysis to study the drivers of these differences across workers, which allows us to control for different characteristics. Because of the panel structure of the data, we need to

use a discrete hazard function approach (for details, see Narendranathan and Stewart (1993); Güell and Petrongolo (2007) for details). The continuous process of exiting self-employment to unemployment is given by the hazard

$$\theta_i\left(t \mid x_i\right) = \lambda\left(t\right) \exp\left(x_i'\beta\right) \tag{3}$$

where $\lambda\left(t\right)$ is the baseline hazard, x_i is the vector of explanatory variables and β is a vector of unknown coefficients.

The discrete hazard is given by

$$h_i\left(t \mid x_i\right) = 1 - \exp\left\{-\int_t^{t+1} \theta_i\left(u \mid x_i\right) du\right\} = 1 - \exp\left\{-\exp\left(x_i'\beta\right)\gamma\left(t\right)\right\} \tag{4}$$

where $\gamma\left(t\right)$ denotes the baseline hazard

$$\gamma\left(t\right) = \int_t^{t+1} \lambda\left(u\right) du \tag{5}$$

.

Hence, we can define the (log) likelihood contribution for the -i^{th} individual with spell of length d_i as:

$$L_i = c_i \ln h_i\left(d_i \mid x_i\right) + \sum_{t=1}^{d_i-1} \ln\left(1 - h_i\left(t \mid x_i\right)\right) =$$

$$c_i \ln\left\{1 - \exp\left[-\exp\left(x_i'\beta\right)\gamma\left(d_i\right)\right]\right\} - \sum_{t=1}^{d_i-1} \exp\left(x_i'\beta\right)\gamma\left(t\right) \tag{6}$$

where c_i is an indicator function that takes a value of 1 if we do not observe the individual exiting to unemployment (censored) and 0 otherwise. We do not impose any functional form on the baseline hazard, but instead we estimate the model semi-parametrically. The vector x_i contains covariates on individual and job-specific characteristics that we treat as time invariant. Finally, self-employment can terminate either because of a transition into

unemployment or because of other alternative states. We need to consider a competing risk model that distinguishes between different reasons of exit. We follow Narendranathan and Stewart (1993) and treat transitions differently than exits to unemployment (i.e. to self-employment or paid-employment) as censored at the time of exit. This allows us to estimate the competing risk model that treats exits into alternative states differently from exits into unemployment as a single-risk model.[16] In the reminder of this section, whenever we refer to survival or exit for self-employed workers, we refer to unemployment as the exiting state.

6.1 Survival analysis: Empirical results

We estimate the econometric model outlined earlier for the transitions out of self-employment to unemployment. The results are presented in Table 19 in the Appendix. Both higher unemployment rates at the province level (we link the unemployment rate to the province where the firm is located, which is longitudinally available, to also control for regional variation), as well as the effect of the business cycle affect increase the hazard of a business failure and exit to unemployment. Transitions to unemployment were less likely during the 2002–07 expansions, and more frequent during the Global Financial Crisis. Education and gender have the expected effects on termination rates, with females and the least-educated exiting more often.

It is interesting to note that hazard rates out of self-employment are significantly different depending on the reason of entry (from unemployment or paid-employment). In particular, workers who enter self-employment with a previous unemployment spell are more likely to terminate their spell sooner and return to unemployment, as we described earlier by comparing average spell duration.

The semi-parametric estimation is informative about the most important characteristics in the survival of self-employment workers from unemployment. We now turn to non-parametric estimators of the survivorship rates by grouping workers into categories based on

[16] Narendranathan and Stewart (1993) show that if distinct destinations depend upon disjoint subsets of parameters, the parameters of a given cause-specific hazard can be estimated by treating durations for other reasons as censored at the time of exit.

Table 8: Survival in self-employment by duration in years

Duration in years	Survival rate
1	87%
2	79%
5	67%
10	57%
15	52%
20	47%

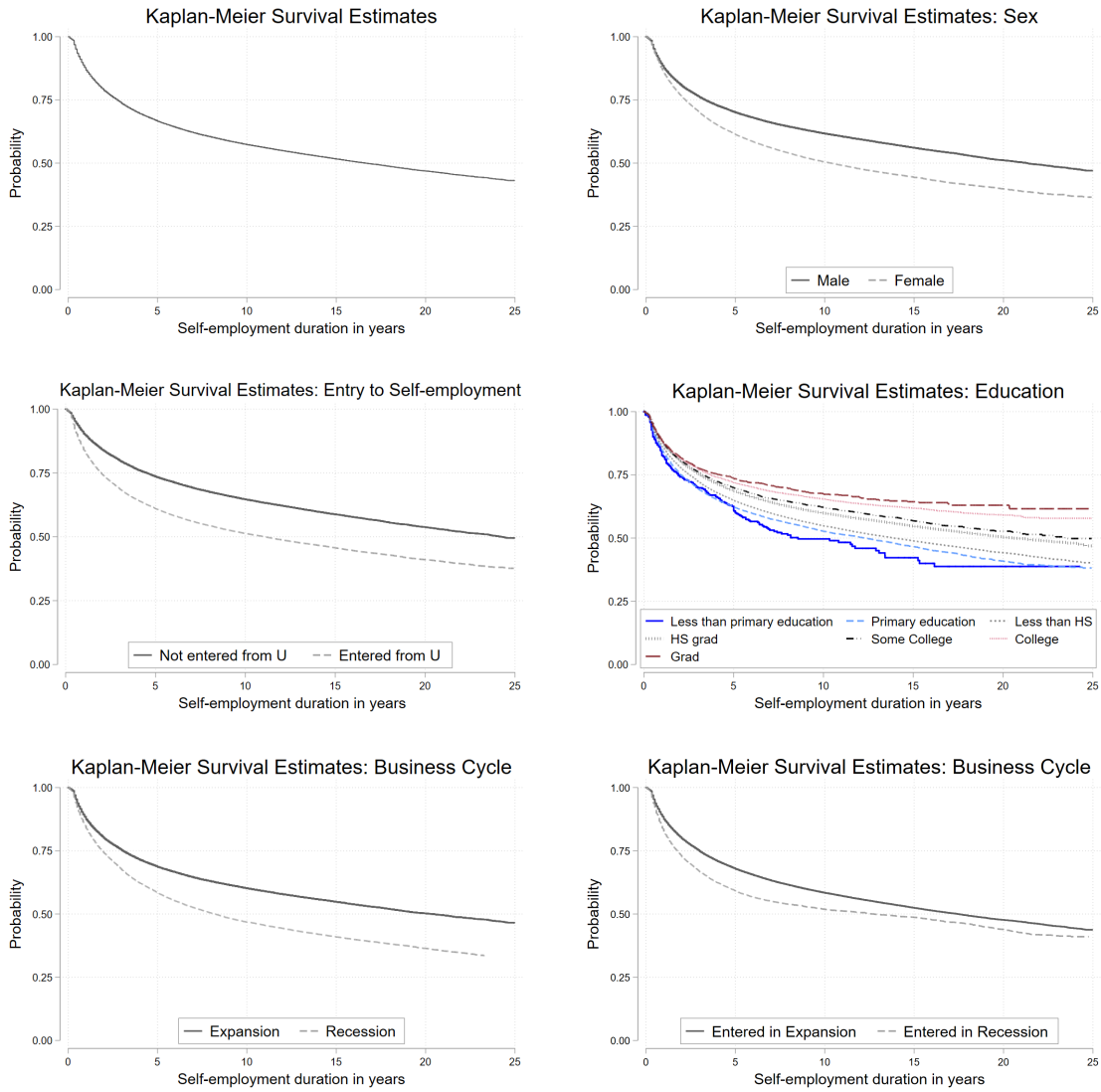
their observable characteristics. We use Kaplan-Meier's procedure to analyze the probability of staying in self-employment for another year if an individual has been in self-employment for T years. To be consistent with our previous results, we define failure as exiting self-employment to unemployment[17], and we study spells that start between 1990 and 2015 for prime-age workers.

Table 8 presents the survival probabilities for the whole sample. It is worth highlighting that 30% of the self-employed become unemployed within 4 years of starting their business, and after 10 years only 57% of the entrants remain in the market.

The proportion of workers who survive in self-employment within the first 10 years becomes lower during recession years (46.9% versus 60.3% in expansion years), for females (50.5% versus 61.8% for males), and for workers who entered self-employment from unemployment (51.4% versus 64.7% if not unemployed before). Survival if entry is during a recession is lower during the initial years of the business, but it converges after 10 years to the rate for those that entered during expansions. Survival is also higher the higher the educational attainment of the worker. Figure 4 presents the estimated survivorship rates for these groups.

[17]Because we are interested in survival from unemployment, we treat exits to paid-employment as censored. We have alternatively defined failure as both exiting to unemployment or paid-employment, and results are basically the same due to the reduced number of SE-E transitions.

Figure 4: Survival rates in self-employment



6.2 The impact of self-employment on lifetime earnings: A dual labor market study

We further investigate the option of self-employment as an escape to unemployment and unstable short-term contracts. We exploit the duality of the Spanish labor market to analyze whether experience in self-employment is a stepping-stone for earnings growth compared to fixed-term employment. Early years in the labor market and experience accrued under different contracts are a crucial source of heterogeneity in earnings growth. Paying special

attention to the main labor contract attachment at young ages, we first analyze workers' labor trajectories and illustrate heterogeneity in returns over the life cycle. We further control for selection and heterogeneity by estimating a rich model of earnings determination as in Topel (1991). Our estimates indicate that returns to general labor market experience are lower for workers who spent most of their years before age 40 as self-employed workers compared to those who spent it as temporary. Lastly, we use this evidence to estimate an income dynamics model over the life cycle as in Karahan and Ozkan (2013). The goal of this analysis is to understand sources of shocks that determine returns under different contracts and ages when designing optimal policies to improve labor market outcomes and job stability.

6.2.1 Career profiles in self-employment

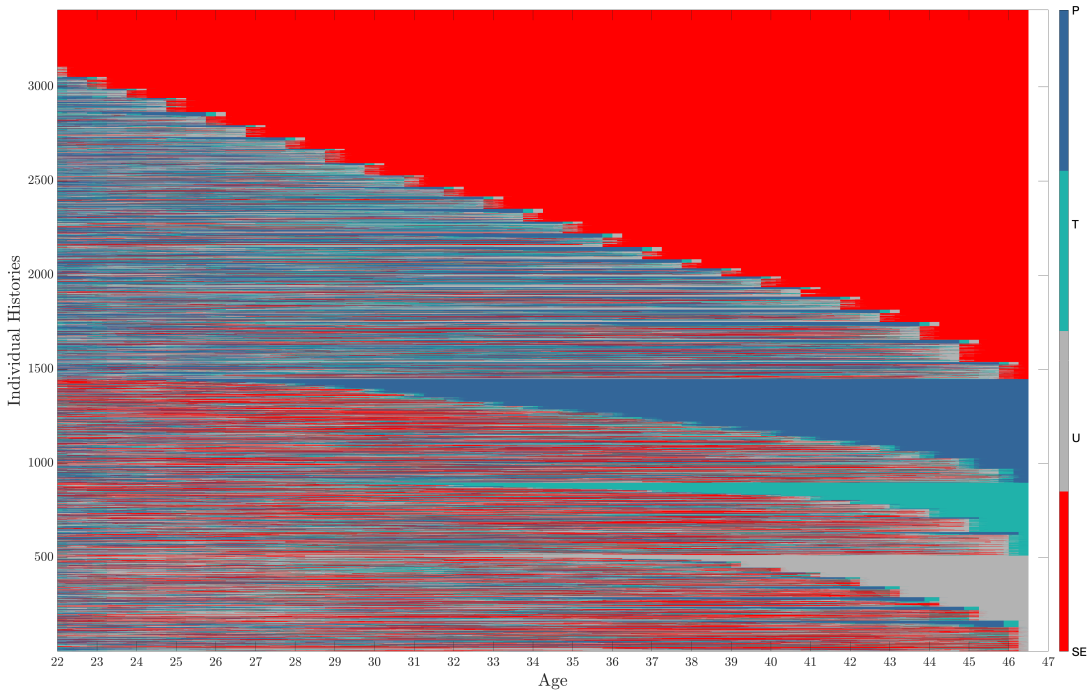
We visually illustrate the heterogeneity in employment profiles for workers with different employment trajectories over the life cycle.[18] Using information on contract duration, we compute at each age total days under each of the following employment statuses: employed-permanent, employed-fixed-term, self-employed, and unemployed. Then, we select the main employment status at each age: permanent worker, fixed-term worker, self-employed, or unemployed. Since we want to understand the importance of job stability at the beginning of a worker's career, when the prevalence of unemployment and unstable employment is the highest, we distinguish between main statuses at young ages. We categorize workers based on which pool of the above mentioned they have spent the most time before turning 40 years old.

In order to illustrate the heterogeneity in career choices, we present Figure 5, which contains employment profiles over the life cycle (22 to 47 years old) for workers who have ever been self-employed. Focusing on career heterogeneity, the horizontal axis of Figure 5 represents the main status at each age, while each row along the vertical axis is a different individual. Interestingly, we find that the share of permanent workers is slightly increasing with age, as well as the share of self-employed. A significant share of workers are still in

[18] The study of life cycle trajectories was first suggested in Abbott (1983). A literature review can be found in Elder *et al.* (2003). More recently, Humphries (2018) uses a trajectory analysis with Norwegian young males who have previously experienced a self-employment spell.

fixed-term employment later in life. The number of workers' transitioning between self-employment and fixed-term employment is also frequent at later ages[19].

Figure 5: Life-cycle trajectories



Trajectories for a balanced panel of Spanish workers who have ever been in a self-employment spell between 22 and 47 years old. The four categories represent permanent (P), fixed-term (T), unemployed (U), and self-employed (SE) workers.

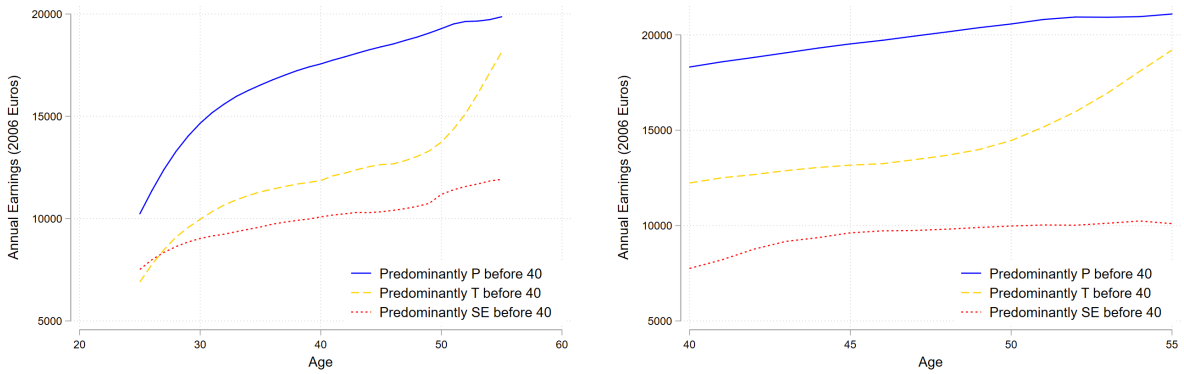
6.2.2 Earnings profiles during and after self-employment

We want to understand whether there are labor market returns in self-employment, especially at young ages, when workers face higher rates of unemployment and temporary jobs. For this purpose, we first look at lifetime earnings of workers based on their main employment status before age 40. The age-earnings profiles for different groups of workers can be found in the left panel of Figure 6. Workers who spend most of their young lives in self-employment perform worse than workers with highly-protected contracts at every year of their lives. These self-employed perform similarly to workers under low-protection contracts before the

[19]Figure 8 in the Appendix presents the proportion of workers in each of the four categories at each age.

age of 30 and worse thereafter.

Figure 6: Age-earnings profiles based on young employment attachment: all (left) and only in paid-employment after 40 (right)



Because the reported earnings for the self-employed are not as reliable as paid-employment income[20], we also calculate these profiles while only in salaried work, distinguishing by acquired experience in self-employment prior to that spell. This includes workers who spent most of their working time before turning 40 years old in self-employment but returned to paid-employment afterwards. We illustrate the duality of the labor market in the right panel in Figure 6. Interestingly, self-employment experience does not seem to be compensated when compared to that of workers predominantly in paid-employment prior to 40 years old. Those mainly self-employed before age 40, unconditional on the contract in paid-employment after 40, earn less than those workers with young experience in fixed-term employment. Moreover, conditional on having a salaried contract after 40, workers predominantly permanent before age 40 have average annual earnings of €20,000 at age 50, twice as much as those predominantly self-employed before age 40. Overall, 78% of predominantly self-employed workers before age 40 are still self-employed at age 50, while only 45% of those predominantly fixed-term before age 40 are still under fixed-term employment at age 50. Instead, 36% have managed to obtain a permanent contract. Since worker heterogeneity and selection play a role in these earnings profiles, we next decompose earnings growth into returns to labor market experience and seniority. This analysis aims at controlling for observed and

[20] Although earnings data come from social security records, for the case of self-employed workers they are self-reported basis of contribution, and hence, subject to higher measurement error.

unobserved characteristics from worker's labor histories to alleviate the selection effect and composition of different groups of workers.

6.2.3 Returns to experience and seniority under self-employment

We use a prototype model for earnings growth as in (Topel, 1991) to study the sources of the different earnings profiles illustrated earlier. While this simple model suffers from some shortcomings (see Buchinsky *et al.* (2010) for a review of the literature), it provides a simple framework to study the source of earnings grow differences across workers. In particular, we use following reduced-form Mincer equation of earnings determination:

$$y_{i,t} = \mu_i + E_{i,t}\beta_1 + T_{i,t}\beta_2 + X_{i,t}\beta_3 + \xi_{it} \tag{7}$$

The dependent variable in equation 7 is the logarithm of the yearly deflated earnings $y_{i,t}$ for worker i in year t. We include the following regressors: μ_i is a person-specific fixed-effect, $E_{i,t}$ is a vector containing worker's i labor market experience at time t, $T_{i,t}$ denotes seniority at the job, $X_{i,t}$ is a vector of observed characteristics, and ξ_{it} is the error term. We estimate this equation separately for workers based on their main labor market attachment before age 40: predominantly permanent, temporary, and self-employed. We construct experience in the dataset using the first date of entry of the worker in the labor market, and tenure as the number of years spent at the current job. In the estimation, we include a quartic polynomial in experience, a quartic polynomial in tenure, year effects, industry effects and person-specific fixed-effects. We cluster standard errors at the individual level.

Table 9: Estimated cumulative returns to experience

Years of labor market experience	2	5	10	15
Predominantly temporary before age 40	0.33	0.63	0.82	0.87
Predominantly self-employed before age 40*	0.16	0.31	0.41	0.44
Predominantly self-employed before age 40**	0.16	0.32	0.44	0.51

*all workers, **only those always in salaried worker after 40.

Table 9 summarizes the estimated returns to experience for different groups based on years of labor market experience (we present the full specification estimates in Table 20 in

the Appendix). In terms of earnings, those workers predominantly in temporary employment before age 40 exhibit returns twice as high to general labor market experience compared to those in self-employment since the beginning of their careers. Even those who return to salaried employment do not get rewarded in terms of earnings, even after controlling for observed and unobserved characteristics. A similar picture emerges when looking at returns to tenure at the firm, they are always higher for workers mainly in temporary employment at young ages. This evidence suggests that self-employment, for the average worker, is not a successful option to escape labor market duality and unemployment when their prevalence is at its highest—i.e., between 20 and 40 years old, since it does not reward workers in terms of earnings later in life.

6.2.4 Age-dependent income dynamics

We next estimate how the income processes for the same groups of workers change over the life cycle, paying special attention at the source and persistence of shocks at different ages. For this purpose, we estimate a workhouse model of income dynamics over the life cycle (Karahan and Ozkan, 2013). We decompose residual earnings into a fixed effect, a permanent shock, and a transitory shock. We then compare the persistence and variance of these shocks across groups based on labor attachment before 40 years old. Formally, we estimate the following equation from earnings data:

$$y^i_{h,t} = \beta X^i_{h,t} + \tilde{y}^i_h \tag{8}$$

where $y^i_{h,t}$ is the log of annual earnings for worker i at age h, $X^i_{h,t}$ contains a quartic polynomial in age, worker's region fixed-effects, and time effects, and $\tilde{y}^i_h$ is the estimation residual. We next define the residual $\tilde{y}^i_h$ as the sum of a fixed effect α^i, a persistent z^i_h component, and temporary component ϵ^i_h

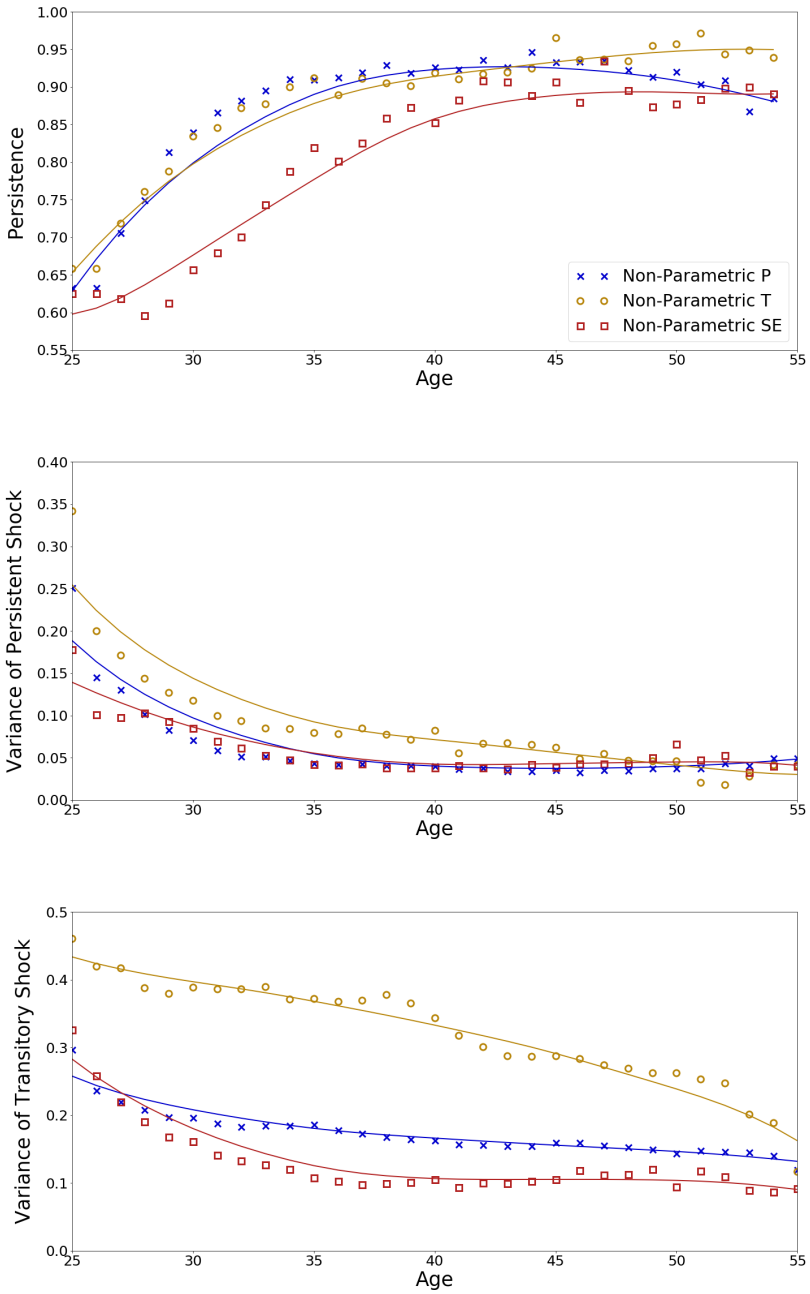
$$\tilde{y}^i_h = \alpha^i + z^i_h + \epsilon^i_h$$

$$z^i_h = \rho_{h-1} z^i_{h-1} + \eta^i_h \tag{9}$$

We further assume that the persistent component follows an AR(1) process with auto-correlation parameter ρ and variance σ^2_η and captures long-lasting changes in earnings. The transitory shock has variance σ^2_ϵ, and captures measurement error and temporary changes in annual earnings. We refer to Karahan and Ozkan (2013) for further details on the specification. We estimate α, ρ^h, $\sigma^2_{\eta_h}$, and $\sigma^2_{\epsilon_h}$ through Generalized Method of Moments. In particular, we minimize the distance between empirical variances and co-variances from the data by age $cov(\tilde{y}^i_h, \tilde{y}^i_{h+n})$, and the theoretical counterparts derived from the model summarized by equation 9. We restrict the estimation to prime-age workers (between 25 and 55 years old) and we target a non-parametric specification, without imposing a specific functional form in the income process. This leaves us with 196 moments and 93 parameters to be estimated for each group. We present the results in Figure 7, highlighting the importance of taking into account age variant profiles as well as heterogeneity across career paths when studying income dynamics.

We observe that at early ages shocks are moderately persistent (as previously found for the United States by Karahan and Ozkan (2013)). Persistence is higher for workers that are predominantly permanent before 40, and lower for those mainly self-employed before this age. In order to interpret these numbers, we compare the number of years that a shock received at different ages takes to fade away. If a shock is received at age 25, 80 percent of its effect dissipates within 5 years for salaried workers, and 90 percent for those mainly self-employed before 40. Persistence increases as workers age. For instance, if the shock is received at age 40, only around 30 percent fades away after 5 years for salaried workers, and 45 percent for those mainly self-employed. At this age, there is again higher persistence for those workers who spend most of their young careers in paid employment.

Figure 7: Income profiles: persistence and variances



Note: Smoothing (solid lines) is performed using LOWESS regressions, with bandwith set to 0.8

The variances of persistent and transitory shocks decrease over the lifetime, but exhibit different patterns across groups. For the variance of persistence shocks, we observe that it declines between ages 25 and 35, and plateaus afterwards for all workers. This variance is

higher over the lifetime for workers employed predominantly in temporary jobs before 40 years old compared to the other groups, suggesting more variability across workers in their labor market outcomes. This pattern also arises for the variance of temporary shocks, which is twice as high for workers mainly in temporary contracts before 40. This is due to the high turnover in these jobs (at most two years according to the legislation), compared to the almost 7 years of average tenure in self-employment and the stability of highly-protected jobs. Ultimately, this analysis draws an interesting fact: while returns to self-employment in the form of earnings growth is lower compared to temporary employment, the variance experienced by the latter is higher. Self-employment in a dual labor market insures against the high turnover from unstable fixed term contracts, but at a cost of flatter earnings profiles.

As an important takeaway, the results indicate that the relevant margins for policy reforms is reducing instability from temporary employment and increasing the returns to self-employment. A deeper analysis is required to formally understand the initial source of differences in earnings growth for the different groups, to disentangle the role of selection in driving the different outcomes, which is beyond the scope of this paper. Nonetheless, the analysis points towards lower human capital accumulation in self-employment compared to salaried work. Moreover, the high turnover of fixed-term employment also affects aggregate human capital through depreciation during frequent unemployment spells. An optimal government intervention should take into account the characteristics of workers and target the accumulation of skills for young workers, including training policies for self-employed workers. Most countries with self-employment promotion policies have subsidies linked to unemployment, and are not available for workers in paid-employment. For instance in Germany, unemployed workers can opt for subsidies to start a business, where the value of the subsidy is linked to an assessment of the project quality. In Spain, unemployed workers, especially the young, can opt for capitalizing their unemployment insurance and obtain fiscal benefits when starting their own business. The higher failure risk into self-employment for young and unemployed workers calls for a revision of these policies, specifically through the design of active labor market policies, such as training policies. Moreover, in countries with strong contract duality, as in Southern Europe, the limited availability of self-employment subsidies interacts

with a strong paid-employment protection. This decreases the profitability of businesses and reduces the stability of employment they create. In conclusion, increasing the survival of entrepreneurs and the accumulation of skills can alleviate high unemployment rates and job instability by incentivizing the creation of long-lasting businesses which foster employment.

7 Conclusions

This paper analyzed the determinants and outcomes of becoming self-employed in labor markets characterized by high unemployment and turnover. We use a large longitudinal data set from the Spanish social security records to shed light on the determinants of becoming self-employed.

Our findings aim to understand the cyclicality of entry into self-employment, by characterizing the type of individuals that enter self-employment at different times, and survival in self-employment, by studying how long they stay out of unemployment. In particular, we have five main findings. First, the probability of becoming self-employed is pro-cyclical: recessions and higher unemployment rates negatively impact the decision to entering self-employment for both unemployed and salaried workers. Second, the probability of entering self-employment from unemployment is lower for female, low-educated, young, and previously fixed-term employees. The probability increases in previous earnings and tenure before the dismissal and if the worker is not receiving unemployment insurance. Third, the probability of entering self-employment from paid-employment decreases on current wage and tenure, and it increases if the worker is employed under a fixed-term, or a part-time contract, or if he is working in a services-related industry (i.e., food and accommodation, household services). Fourth, survival rates in self-employment are higher during expansions and for workers who did not experience unemployment before starting their business than for those who were unemployed. These workers enjoy higher earnings and longer spells in self-employment, compared to those entering from unemployment. Fifth, when returning to paid-employment, workers who spent a predominant share of their careers before age 40 in self-employment earn less than recurrent fixed-term workers. This is due to both lower

returns to general experience and tenure for workers in the former group. However, the results of estimating a rich model of life-time income dynamics suggest that the latter set of workers experience more volatile permanent and transitory shocks due to the high turnover of fixed-term contracts.

The evidence and estimates presented in this paper can be used to discipline structural models that aim at studying self-employment reforms, through the use of government instruments that target the training and survival of the self-employed. This will improve labor market outcomes for those groups of workers that traditionally face high unemployment rates (i.e., females, young workers) and unstable employment. By performing welfare comparisons between different policies, researchers can assess the costs and benefits of government intervention through active policies in the rigid labor markets. Finally, while we performed the analysis for Spain due to data availability, our conclusions are not restricted to Southern Europe: the rise of the gig economy makes it necessary to understand the role of the government in reducing labor market frictions such as unemployment and labor market segmentation.

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A Appendix: Additional Tables

Table 10: Self-employment earnings by industry

Industry	Mean	Median	Std	% Obs
Agriculture	860.3	799.7	273.2	1.7%
Manufacturing	1041.7	830.9	529.8	8.8%
Energy	1383.5	868.6	796.8	0.2%
Construction	918.7	803.9	359.6	13.3%
Transportation and trade	920.2	817.7	388.1	32.3%
Food and accommodation	856.3	799.7	253.6	8.9%
IT and finance	1111.2	817.7	670.7	3.7%
Real estate and professionals	1024.9	817.7	565.8	14.1%
Public administration	1340.7	868.6	758.9	2.0%
Education	1065.8	817.7	588.7	2.7%
Health	1157.5	829.3	703.7	3.7%
Arts and household services	897.2	802.7	376.0	8.6%

Source: MCVL-Seguridad Social, own calculations

Table 11: Self-employment education attainment by industry

Industry	Less than HS(%)	HS grads (%)	Some college (%)	College grads (%)
Agriculture	59.9	27.1	5.3	7.8
Manufacturing	54.7	34.1	5.3	6.0
Energy	44.2	36.2	7.5	12.1
Construction	68.6	24.2	3.5	3.7
Transportation and trade	55.0	33.2	4.7	7.1
Food and accommodation	66.9	26.5	3.3	3.3
IT and finance	21.5	44.5	11.5	22.5
Real estate and professionals	21.3	35.1	12.0	31.7
Public administration	36.5	33.3	8.2	21.9
Education	15.2	34.6	16.4	33.8
Health	11.9	26.7	16.7	44.7
Arts and household services	50.3	33.8	5.9	10.0

Source: MCVL-Seguridad Social, own calculations

Table 12: Probability of entering self-employment from unemployment

Constant	-3.601***	(-72.46)
Female	-0.276***	(-91.41)
National UR	-0.00453***	(-17.62)
Age	0.0540***	(28.00)
Age^2	-0.000636***	(-24.71)
Years of schooling = 6	0.0474*	(1.79)
Years of schooling = 8	0.155***	(5.88)
Years of schooling = 12	0.231***	(8.75)
Years of schooling = 15	0.226***	(8.43)
Years of schooling = 16	0.275***	(10.35)
Years of schooling = 18	0.203***	(7.23)
UI recipient	-0.0397***	(-12.70)
Recession quarter	-0.0647***	(-17.63)
Prior spell		
Earnings	0.000104***	(40.35)
Temporary worker	-0.0924***	(-26.12)
Tenure	0.00100***	(7.77)
Part-time job	0.0336***	(9.02)
Last industry		
Manufacturing	-0.0437**	(-2.28)
Energy	-0.186***	(6.33)
Construction	0.0192	(1.00)
Transportation and trade	0.0347*	(1.83)
Food and accommodation	-0.00380	(-0.20)
IT and finance	0.0227	(1.12)
Real estate and professionals	-0.0292	(-1.53)
Public administration	-0.140***	(7.23)
Education	-0.0540***	(-2.68)
Health	-0.129***	(-6.40)
Arts and household services	0.0884***	(4.51)
Cohort effects		
1945-1949	0.119***	(5.08)
1950-1954	0.123***	(5.41)
1955-1959	0.149***	(6.91)
1960-1964	0.187***	(8.87)
1965-1969	0.217***	(10.21)
1970-1974	0.291***	(13.53)
1975-1979	0.350***	(16.09)
1980-1984	0.390***	(17.63)
1985-1989	0.458***	(20.03)
N	6618160	

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, ***$p < 0.01$

Table 13: Probability of entering self-employment from unemployment (year fixed effects)

Constant	-3.079***	(-64.55)
Female	-0.274***	(-90.59)
Age	0.0417***	(23.11)
Age^2	-0.000612***	(-25.61)
Years of schooling = 6	0.0475*	(1.79)
Years of schooling = 8	0.152***	(5.76)
Years of schooling = 12	0.227***	(8.61)
Years of schooling = 15	0.223***	(8.30)
Years of schooling = 16	0.272***	(10.20)
Years of schooling = 18	0.199***	(7.07)
Prior spell		
Earnings	0.000108***	(41.77)
Temporary worker	-0.0975***	(-26.90)
Tenure	0.000908***	(7.00)
Part-time job	0.0331***	(8.88)
Last industry		
Manufacturing	-0.0282	(-1.47)
Energy	-0.172***	(-5.85)
Construction	0.0381**	(1.99)
Transportation and trade	0.0493***	(2.59)
Food and accommodation	0.00907	(0.47)
IT and finance	0.0354*	(1.75)
Real estate and professionals	-0.0127	(-0.66)
Public administration	-0.127***	(-6.55)
Education	-0.0405**	(-2.01)
Health	-0.117***	(-5.77)
Arts and household services	0.102***	(5.20)
Year effects		
1991	0.00218	(0.11)
1992	-0.0807***	(-4.34)
1993	-0.190***	(-10.40)
1994	-0.0811***	(-4.68)
1995	-0.0458***	(-2.68)
1996	-0.0742***	(-4.35)
1997	-0.0726***	(-4.28)
1998	-0.0524***	(-3.10)
1999	-0.0229	(-1.36)
2000	-0.0175	(-1.04)
2001	0.00368	(0.22)
2002	0.0114	(0.68)
2003	0.0733***	(4.40)
2004	0.111***	(6.72)
2005	0.130***	(7.87)
2006	0.147***	(8.86)
2007	0.140***	(8.39)
2008	0.0787***	(4.70)
2009	-0.0514***	(-3.08)
2010	-0.0383**	(-2.32)
2011	0.0159	(0.97)
2012	0.0349**	(2.14)
2013	0.0992***	(6.13)
2014	0.190***	(11.76)
2015	0.223***	(13.57)
N	6618160	

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Probability of entering self-employment from unemployment (Different periods)

	1990-2000		2001-2015		2010-2015	
Constant	-2.819***	(-24.59)	-3.865***	(-53.69)	-4.995***	(-39.37)
Female	-0.354***	(-61.05)	-0.246***	(-69.39)	-0.195***	(-38.38)
National UR	-0.00924***	(-10.55)	-0.00714***	(-16.01)	0.0128***	(10.89)
Age	0.0493***	(8.68)	0.0579***	(21.63)	0.0940***	(15.18)
Age^2	-0.000752***	(-9.16)	-0.000622***	(-17.98)	-0.000996***	(-12.51)
Years of schooling = 6	0.0206	(0.47)	0.0643*	(1.93)	0.0423	(0.89)
Years of schooling = 8	0.121***	(2.78)	0.177***	(5.35)	0.144***	(3.04)
Years of schooling = 12	0.178***	(4.06)	0.259***	(7.82)	0.240***	(5.07)
Years of schooling = 15	0.157***	(3.51)	0.256***	(7.64)	0.270***	(5.63)
Years of schooling = 16	0.135***	(3.03)	0.326***	(9.77)	0.354***	(7.42)
Years of schooling = 18	0.0431	(0.87)	0.259***	(7.43)	0.307***	(6.21)
UI recipient	-0.0733***	(-11.90)	-0.0360***	(-9.80)	-0.0178***	(-3.40)
Recession quarter	-0.0836***	(-8.89)	-0.0714***	(-17.56)	-0.0933***	(-16.34)
Prior spell						
Earnings	0.0000931***	(19.13)	0.000109***	(35.48)	0.0000949***	(21.13)
Temporary worker	-0.205***	(-7.89)	-0.0872***	(-23.12)	-0.110***	(-19.36)
Tenure	0.000372	(1.59)	0.00127***	(8.04)	0.000840***	(3.97)
Part-time job	0.0399***	(4.94)	0.0322***	(7.63)	0.0419***	(7.08)
Cohort effects						
1945-1949	0.0785***	(3.02)				
1950-1954	0.00388	(0.12)	0.101***	(2.71)		
1955-1959	-0.0493	(-1.34)	0.169***	(4.81)		
1960-1964	-0.0940**	(-2.38)	0.235***	(6.70)	0.0692***	(3.15)
1965-1969	-0.104**	(-2.54)	0.281***	(7.78)	0.116***	(4.34)
1970-1974	-0.108**	(-2.52)	0.392***	(10.52)	0.227***	(7.17)
1975-1979	-0.147***	(-2.73)	0.467***	(12.18)	0.329***	(9.33)
1980-1984			0.528***	(13.32)	0.487***	(12.83)
1985-1989			0.620***	(14.97)	0.596***	(14.61)
Last industry						
Manufacturing	-0.0424	(-1.02)	-0.0501**	(-2.32)	-0.0551**	(-2.06)
Energy	-0.225***	(-3.54)	-0.174***	(-5.28)	-0.162***	(-3.83)
Construction	-0.0103	(-0.25)	0.0265	(1.23)	0.00732	(0.28)
Transportation and trade	0.0442	(1.06)	0.0275	(1.29)	0.0209	(0.80)
Food and accommodation	0.00181	(0.04)	-0.00930	(-0.43)	-0.00830	(-0.31)
IT and finance	-0.124***	(-2.77)	0.0562**	(2.48)	0.0605**	(2.15)
Real estate and professionals	-0.0580	(-1.38)	-0.0224	(-1.04)	-0.0191	(-0.73)
Public administration	-0.144***	(-3.43)	-0.142***	(-6.46)	-0.167***	(-6.09)
Education	-0.0856*	(-1.95)	-0.0442*	(-1.95)	-0.0336	(-1.19)
Health	-0.181***	(-4.11)	-0.110***	(-4.82)	-0.116***	(-4.09)
Arts and household services	0.0323	(0.76)	0.104***	(4.73)	0.118***	(4.32)
N	2032704		4585456		2204698	

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 15: Probability of entering self-employment from unemployment: recession*industry interactions

Constant	-3.574***	(-71.11)
Female	-0.276***	(-91.38)
National UR	-0.00456***	(-17.73)
Age	0.0541***	(28.03)
Age^2	-0.000637***	(-24.74)
Years of schooling = 6	0.0473*	(1.78)
Years of schooling = 8	0.155***	(5.88)
Years of schooling = 12	0.231***	(8.75)
Years of schooling = 15	0.226***	(8.42)
Years of schooling = 16	0.275***	(10.34)
Years of schooling = 18	0.203***	(7.22)
UI recipient	-0.0396***	(-12.68)
Recession quarter	-0.248***	(-4.47)
Prior spell		
Earnings	0.000104***	(40.46)
Temporary worker	-0.0923***	(-26.08)
Tenure	0.00101***	(7.81)
Part-time job	0.0338***	(9.07)
Cohort effects		
1945-1949	0.120***	(5.10)
1950-1954	0.123***	(5.42)
1955-1959	0.149***	(6.91)
1960-1964	0.187***	(8.88)
1965-1969	0.217***	(10.21)
1970-1974	0.291***	13.53)
1975-1979	0.350***	(16.09)
1980-1984	0.390***	(17.62)
1985-1989	0.458***	(20.03)
N	6618160	

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 16: Probability of entering self-employment from unemployment: recession*industry interactions (cont)

Last industry		
Manufacturing	-0.0736***	(-3.57)
Energy	-0.190***	(-5.95)
Construction	0.00726	(0.35)
Transportation and trade	0.00655	(0.32)
Food and accommodation	-0.0349*	(-1.68)
IT and finance	-0.0129	(-0.59)
Real estate and professionals	-0.0601***	(-2.92)
Public administration	-0.171***	(-8.20)
Education	-0.0905***	(-4.16)
Health	-0.162***	(-7.42)
Arts and household services	0.0585***	(2.77)
Last industry * recession		
Manufacturing	0.195***	(3.45)
Energy	0.0628	(0.77)
Construction	0.112**	(1.98)
Transportation and trade	0.186***	(3.31)
Food and accommodation	0.202***	(3.56)
IT and finance	0.222***	(3.80)
Real estate and professionals	0.200***	(3.55)
Public administration	0.202***	(3.36)
Education	0.230***	(3.95)
Health	0.209***	(3.56)
Arts and household services	0.195***	(3.41)
N	6618160	

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 17: Probability of entering self-employment from employment (Cohort + recession)

Constant	-2.716***	(-44.26)
Female	-0.251***	(-65.75)
National UR	-0.00151***	(-4.96)
SMSA	-0.272***	(-77.26)
Age	0.0269***	(11.03)
Age^2	-0.000444***	(-13.36)
Years of schooling = 6	0.0345	(1.00)
Years of schooling = 8	0.0862**	(2.52)
Years of schooling = 12	0.123***	(3.60)
Years of schooling = 15	0.162***	(4.66)
Years of schooling = 16	0.268***	(7.75)
Years of schooling = 18	0.349***	(9.74)
Recession quarter	-0.0309***	(-6.90)
Prior spell		
Earnings	-0.000247***	(-75.92)
Temporary worker	0.139***	(35.79)
Tenure	-0.00520***	(-35.97)
Part-time job	0.0287***	(6.30)
Last industry		
Manufacturing	-0.0607***	(2.67)
Energy	-0.214***	(6.20)
Construction	0.169***	(7.47)
Transportation and trade	0.108***	(4.80)
Food and accommodation	0.165***	(7.18)
IT and finance	0.0582**	(2.44)
Real estate and professionals	0.0365	(1.61)
Public administration	-0.158***	(6.68)
Education	-0.00251	(-0.10)
Health	-0.0831***	(-3.51)
Arts and household services	0.173***	(7.43)
Cohort effects		
1945-1949	0.00267	(0.10)
1950-1954	-0.0275	(-1.03)
1955-1959	-0.0906***	(-3.56)
1960-1964	-0.112***	(-4.51)
1965-1969	-0.106***	(-4.26)
1970-1974	-0.107***	(-4.24)
1975-1979	-0.123***	(-4.84)
1980-1984	-0.148***	(-5.74)
1985-1989	-0.154***	(-5.76)
N	23001845	

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 18: Probability of entering self-employment from employment (year fixed effects)

Constant	-2.932***	(-49.97)
Female	-0.249***	(-65.33)
SMSA	-0.272***	(-77.22)
Age	0.0273***	(12.12)
Age^2	-0.000416***	(-13.68)
Years of schooling = 6	0.0353	(1.02)
Years of schooling = 8	0.0858**	(2.51)
Years of schooling = 12	0.123***	(3.58)
Years of schooling = 15	0.162***	(4.66)
Years of schooling = 16	0.268***	(7.74)
Years of schooling = 18	0.347***	(9.69)
Prior spell		
Earnings	-0.000244***	(-74.99)
Temporary worker	0.145***	(36.69)
Tenure	-0.00513***	(-35.48)
Part-time job	0.0299***	(6.56)
Last industry		
Manufacturing	-0.0582**	(-2.56)
Energy	-0.212***	(-6.15)
Construction	0.170***	(7.52)
Transportation and trade	0.111***	(4.91)
Food and accommodation	0.167***	(7.26)
IT and finance	0.0609**	(2.55)
Real estate and professionals	0.0386*	(1.69)
Public administration	-0.157***	(-6.62)
Education	-0.00139	(-0.06)
Health	-0.0837***	(-3.54)
Arts and household services	0.175***	(7.52)
Year effects		
1991	0.0115	(0.55)
1992	0.0338*	(1.67)
1993	0.000901	(0.04)
1994	0.102***	(5.33)
1995	0.0534***	(2.82)
1996	0.0227	(1.21)
1997	0.0308*	(1.67)
1998	0.0848***	(4.78)
1999	0.0674***	(3.83)
2000	0.0309*	(1.77)
2001	0.00633	(0.36)
2002	0.0275	(1.60)
2003	0.0128	(0.75)
2004	0.0559***	(3.30)
2005	0.0133	(0.78)
2006	0.0609**	(3.62)
2007	0.0666***	(3.96)
2008	-0.00865	(-0.51)
2009	-0.0677***	(-3.86)
2010	-0.0507***	(-2.89)
2011	-0.0503***	(-2.88)
2012	-0.0267	(-1.54)
2013	-0.0124	(-0.72)
2014	0.0188	(1.10)
2015	-0.0199	(-1.15)
N	23001845	

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 19: ML estimates of the transition from self-employment to unemployment: 1990-2015

Female	0.269***	(23.68)
Unemployed before	0.323***	(28.99)
Age 25-34	0.00847	(0.63)
Age 35-44	0.0361***	(2.82)
Age 45+	-0.0275	(-0.49)
Province UR	0.0170***	(17.47)
SMSA	0.223***	(19.37)
Recession quarter	-0.00340	(-0.16)
Years of schooling = 6	0.230**	(2.16)
Years of schooling = 8	0.143	(1.36)
Years of schooling = 12	-0.000998	(-0.01)
Years of schooling = 15	-0.0958	(-0.89)
Years of schooling = 16	-0.259**	(-2.42)
Years of schooling = 18	-0.207*	(-1.80)
Manufacturing	0.676***	(10.11)
Energy	0.386**	(2.21)
Construction	1.065***	(16.34)
Transportation and trade	0.656***	(10.17)
Food and accommodation	1.063***	(16.30)
IT and finance	0.724***	(10.35)
Real estate and professionals	0.718***	(10.94)
Public administration	1.993***	(29.47)
Education	0.794***	(11.15)
Health	0.268***	(3.65)
Arts and household services	0.589***	(8.84)
1991	-0.217	(-1.61)
1992	-0.276**	(-2.12)
1993	-0.484***	(-3.81)
1994	-1.003***	(-7.88)
1995	-1.018***	(-8.16)
1996	-1.051***	(-8.51)
1997	-1.045***	(-8.52)
1998	-1.139***	(-9.30)
1999	-1.269***	(-10.29)
2000	-1.355***	(-10.95)
2001	-1.140***	(-9.37)
2002	-1.188***	(-9.79)
2003	-0.789***	(-6.69)
2004	-0.242**	(-2.10)
2005	-0.223*	(-1.94)
2006	-0.209*	(-1.82)
2007	-0.185	(-1.61)
2008	0.271**	(2.34)
2009	0.242**	(2.11)
2010	0.264**	(2.32)
2011	0.334***	(2.92)
2012	0.427***	(3.69)
2013	0.270**	(2.36)
2014	0.165	(3.70)
2015	-0.0651	(-0.57)
N	3,426,457	

t statistics in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Figure 8: Life-cycle shares

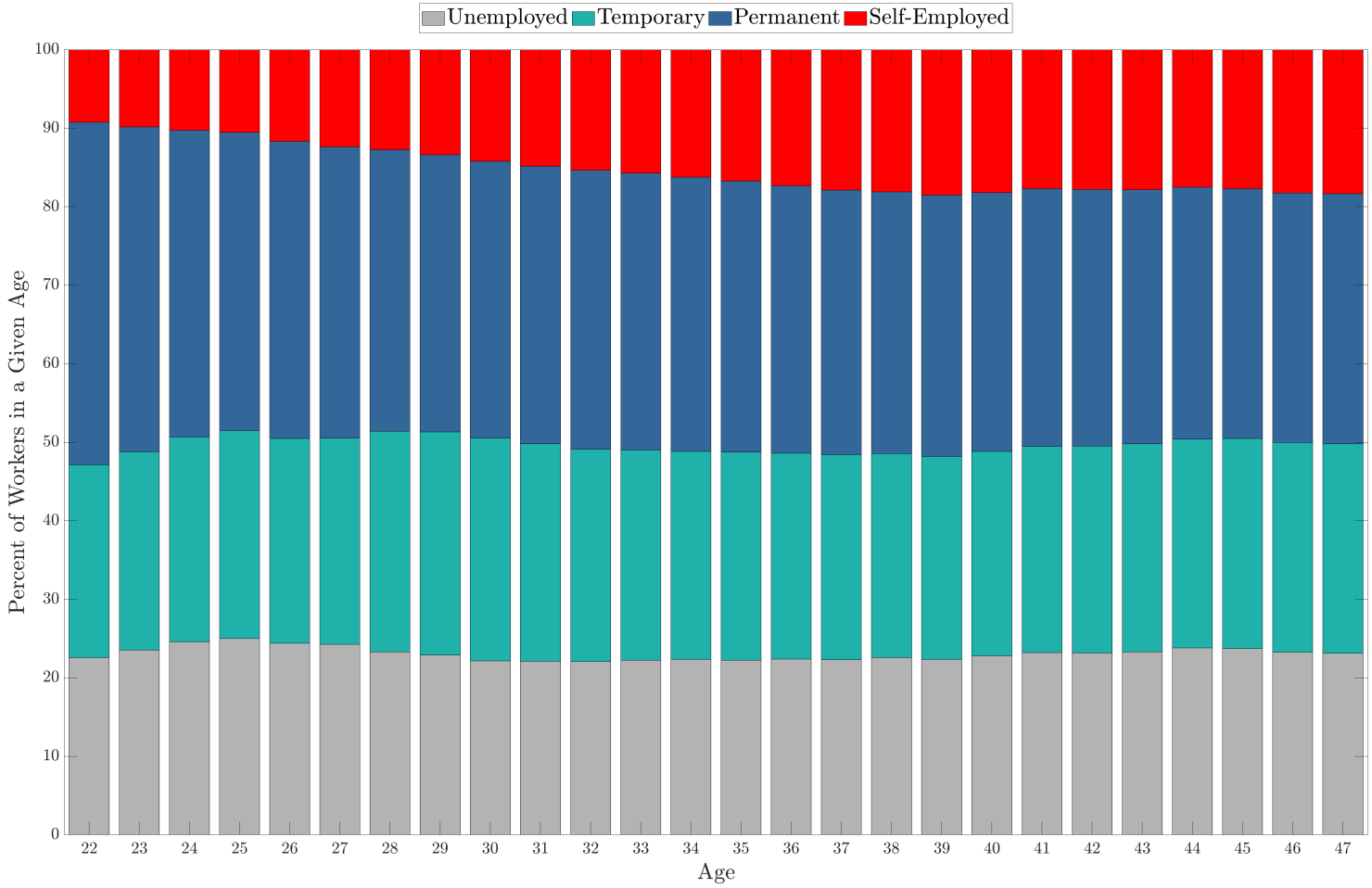

Table 20: Mincer regression by young experience groups

	Permanent		Temporary		Self-employed (I)		Self-employed (II)		Self-employed (III)	
Variable	Mean	Std	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Constant	8.622	0.014	8.067	0.020	8.486	0.024	8.255	0.061	8.542	0.030
Experience	0.155	0.001	0.196	0.002	0.097	0.002	0.097	0.007	0.090	0.002
Exp.^{2}/100	-1.279	0.011	-1.712	0.023	-0.858	0.021	-0.814	0.074	-0.794	0.023
Exp.^{3}/1000	0.460	0.005	0.663	0.011	0.340	0.010	0.329	0.032	0.310	0.010
Exp.^{4}/10000	-0.058	0.001	-0.089	0.002	-0.046	0.001	-0.045	0.005	-0.041	0.002
Tenure	0.159	0.001	0.235	0.002	0.127	0.003	0.347	0.007	0.109	0.003
Ten.^{2}/100	-1.988	0.011	-3.298	0.049	-1.714	0.057	-7.874	0.264	-1.419	0.051
Ten.^{3}/1000	0.915	0.007	1.617	0.038	0.810	0.036	6.340	0.322	0.661	0.032
Ten.^{4}/1000	-0.135	0.001	-0.250	0.008	-0.123	0.007	-1.649	0.117	-0.099	0.006

(I) All predominantly young self-employed. (II) Predominantly young self-employed, never self-employed after age 40. (III) Predominantly young self-employed, ever self-employed after age 40. All the specifications also include a full set of year dummies, twelve industry dummies, and person fixed-effects. Standard errors clustered at the individual level.