

Does Self-Employment Pay? The Role of Unemployment and Earnings Risk *

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Abstract

This paper studies the role of earnings risk in reconciling the observed lower earnings returns in self-employment. Using Spanish administrative data, we characterize the distribution and dynamics of earnings and document lower and less dispersed earnings in self-employment. We consider alternative hypotheses and highlight the role of lower unemployment risk in self-employment. We decompose earnings risk dynamics by estimating a life-cycle earnings process. Indeed, the self-employed experience lower returns but face lower volatility and persistence of shocks. Our results rule out theories in favor of experimentation and earnings growth in self-employment, and highlight the trade-off between earnings and unemployment risk.

Keywords: self-employment, segmented labor markets, earnings risk, income process

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1 Introduction

This paper studies the role of unemployment and earnings risk in reconciling the observed lower earnings returns in self-employment relative to paid-employment. Previous studies have documented that the self-employed exhibit lower earnings returns compared to similarly experienced salaried employees, while facing entrepreneurial risk. The prevalent explanations to this *puzzle* include negative selection into self-employment (Evans and Leighton, 1989), the existence of non-pecuniary benefits from self-employment (Hamilton, 2000), and the value of experimentation (Dillon and Stanton, 2013). We argue that, much in the spirit of the finance literature, to understand the returns we need to look at the risk, both in self-employment and the salaried alternatives. In particular, given the dynamic implications of occupational choice, there is a return-risk trade-off in life-cycle earnings (Dillon, 2018). This trade-off, in unstable labor markets, favors the self-employment option for some workers.

We exploit differences in employment protection to show how, when job turnover is high and unemployment pervasive, the self-employed face lower earnings risk. To illustrate this idea, we use the Spanish labor market, characterized by high unemployment and segmented job opportunities in terms of protection, as an ideal laboratory. Efforts to make the market more flexible while maintaining stringent employment protection have segmented paid-employment opportunities: 30 percent of salaried workers are employed under unstable, fixed-term contracts, while the rest enjoy permanent contracts with high dismissal costs. These high mandatory dismissal costs for those already employed make firms reluctant to offer stable paid-employment and more prone to hiring under temporary unprotected contracts whenever possible, giving rise to the so-called dual labor markets in terms of job security. Hence, the share of workers in fixed-term contracts grows in each cohort and makes the younger workers disproportionately exposed to unemployment risk. During the Great Recession, Spanish unemployment spiked above 25 percent, and youth unemployment surpassed 50 percent. In the context of high unemployment and scarce stable employment opportunities, these rigidities translate into lower finding rates and increasingly low job stability for new salaried workers. At the same time, self-employment remains one of the highest in Europe at about 18 percent of the labor force.

We use the complete labor histories of a 4% sample of Spanish social security affiliates (approximately 1.2 million individuals), observing workers transitioning across labor market states

and their earnings. Our data set, known as *Muestra Continua de Vidas Laborales* (MCVL), has three key advantages: (1) the administrative nature, alleviating measurement error; (2) the large sample size, reducing the limitations of survey data; and (3) the longitudinal design, which allows us to follow the working histories of all individuals over the last three decades, including two different recessions, a large labor market reform, and the highest growth decade in Spain's recent history. Most importantly, the richness of the data set in labor market outcomes, firm characteristics, and demographics allows us to control for observed characteristics and deal with unobserved heterogeneity.

In the first part of this paper, we document stylized facts on labor earnings and life-cycle dynamics across employment states. We first study the cross-sectional distribution of labor earnings for workers in paid-employment with different job protection levels and for the self-employed. We find that most self-employment consists of small business owners that stay in business for longer tenures than salaried workers. Moreover, earnings in self-employment are lower on average and have smaller dispersion than workers on temporary contracts. Next, we classify workers into three categories based on their main employment status before age 40: mainly self-employed, mainly temporary workers, and mainly permanent workers. According to these groups, we look at workers' age-earnings profiles, finding that those predominantly in self-employed when young experience lower earnings growth over their lives. Finally, we exploit the longitudinal dimension of our data to study the dynamic earnings returns to labor market experience in paid-employment and self-employment, paying particular attention to workers' contract histories. In line with the previous literature, we find that workers in self-employment exhibit lower market returns compared to similarly experienced workers in paid-employment, even to those in unstable fixed-term employment.

In the second half of the paper, we relate the findings above with some theoretical explanations. In particular, we consider measurement issues, negative selection into self-employment, search frictions and job shopping in segmented labor markets, and lower lifetime labor earnings risk in self-employment. We test these hypotheses against the data to shed light on the mechanisms driving the lower earnings and market returns in self-employment. We do not find support for the existence of a job ladder in self-employment, as turnover is low and earnings growth limited, as opposed to paid-employment, where the higher unemployment risk is a driver for job shopping, resulting in earnings growth. We also do not see evidence that experimentation is a

main driver of selection into self-employment or that workers face little penalty when returning to paid-employment (see for instance [Daly \(2015\)](#) or [Manso \(2016\)](#) for comprehensive literature reviews). In our dataset, we observe self-employment spells to be longer on average than those in salaried employment, and returns to experience in self-employment after returning to salaried work are low. We find measurement issues and negative selection unlikely given the administrative nature of our data and in light of the longitudinal results in the empirical analysis, which control for unobserved heterogeneity. However, we acknowledge the limitations of our analysis in measuring non-pecuniary benefits. Finally, we estimate a rich statistical model of lifetime earnings dynamics, grouping workers based on their youth employment status. Key to our mechanism, we find that the self-employed face lower permanent and transitory changes to their income over their lifetime, especially compared to workers these same fixed-term workers. The explanation is simple and was long ago introduced by Adam Smith ([Smith, 1776](#)) as a compensating earnings differential: When job turnover is high, workers in self-employment are willing to accept a lower compensation to be insured against unemployment risk. In this sense, self-employment becomes a lower-risk and long-lasting employment option. Without ruling out the existence of non-pecuniary benefits or intangible returns such as *sweat equity* ([Bhandari and McGrattan, 2020](#)), we conclude that lower earnings risk in self-employment compared to some of the salaried alternatives is a relevant channel when reconciling the self-employment option in labor markets with high turnover.

The findings in this paper document a novel channel—unemployment risk differentials in the labor market—to answer an open question on workers’ employment choice between paid employment and self-employment. This channel has been documented in the literature at the industry or occupation level, without specific attention to the case of self-employment. For instance, [Cubas and Silos \(2017\)](#) find a positive correlation at the industry level between earnings and occupation risk and average wages. Similarly, [Dillon \(2018\)](#) finds an essential role of earnings and employment risk in sorting workers across occupations. Our empirical analysis hinges on how earnings risk dynamics alter workers’ outside options. [Humphries \(2018\)](#) documents the heterogeneity in skills and capital when selecting into self-employment as the driver for the dispersion in self-employment earnings, rather than entrepreneurial risk. In line with this latter idea, we document that, when most self-employed are not entrepreneurs but small business owners, heterogeneity in earnings risk matters and self-employment duration increases as the role of insurance against un-

employment risk emerges. The results we present will further allow to discipline macroeconomic models by using the second moment of the earnings distribution and its decomposition into permanent and transitory components, without relying on large taste shocks or switching parameters to reconcile the option of becoming self-employed.

This analysis is also useful to design active labor market policies aimed at reducing unemployment and promoting self-employment. Many recent papers analyze the role of self-employment promotion policies and its welfare consequences (Humphries, 2018), some of them in a high unemployment risk context (Hombert et al., 2014; Ocampo and Herreño, 2020). We present evidence that, in the context of segmented markets in terms of job protection, selection into self-employment is influenced by the lifetime earnings risk in all outside options, including riskier salaried alternatives. Hence, reassessing labor policies to consider earnings risk dynamics is crucial for policymakers. Finally, the results of this analysis are necessary to understand trends even in labor markets that are traditionally more flexible, such as in the United States. The rise of the gig economy, as well as differential unemployment rates across industries, have segmented the job opportunities workers face, affecting unemployment and earnings risk.

The rest of the paper is organized as follows. Section 2 summarizes the main features of the data. Section 3 studies earnings and returns in self-employment compared to two segmented salaried markets. Section 4 compares theoretical explanations to shed light on the mechanisms driving the facts presented in Section 3. Section 5 concludes.

2 Data on Full Labor Histories

The Spanish Social Security Administration (SSSA) Data. We use the SSSA's *Muestra Continua de Vidas Laborales* (MCVL) data set. It consists of a 4% representative sample of Spanish individuals affiliated with the SSSA in 2013-2016, whether they are employed, unemployed, or retired. Workers are added every year to maintain the representativeness of the sample, as workers who end their affiliation are removed. The sample size is about 1.2 million individuals per year. The underlying source is the actual legal contracts signed between firms and workers. We observe the full workers' demographics and job daily histories from the first day of affiliation until 2016. Detailed job information is available back to 1967 and reliable monthly earnings data (based on social security contributions) back to 1980.

Sample Selection. 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 for earnings dynamics is 1990 to 2016, although we use all available information from workers’ labor histories to obtain their past trajectories.

Main Variables. For each working spell, relevant variables are the contract start and end date, the type of contract, occupation, salaries, and the cause of dismissal, as well as firm’s location, size, sector, and legal status. Of particular importance is the differentiation of the self-employed by their relation to other self-employed within the same firm, which allows us to identify and exclude the *dependent* self-employed¹. For nonemployment spells, we observe the associated unemployment benefits and pension amount, as well as retirement date of the worker. We define income throughout the paper as labor earnings, specifically monthly contribution basis to the social security administration.² We deflate nominal monthly earnings and unemployment benefits using the Spanish CPI with base year 2016 provided by the National Institute of Statistics (INE). Finally, demographic and residence information in the dataset is matched from the Census.

The information in the data set is therefore detailed at a daily frequency and of high quality due to its administrative origin.³ Most importantly, we can precisely identify self-employment spells from paid- and non-employment using the type of *regime*, or legal contract code. We refer to the Data Appendix for further details.

Descriptive statistics. We present an overview of the Spanish labor market, focusing on worker’s characteristics, in Table 1, which highlights the richness of the dataset. The self-employed are on average older, earn less, and have been at their current firm for a longer time compared to workers in salaried employment. They tend to have a lower educational attainment and are predominantly male. In terms of the legal nature of the firms they own, they tend to be constituted mostly as sole proprietors or members of a cooperative.

¹They represent less than 1% of our sample.

²In the case of salaried workers, this is reported by the firm. For self-employed workers, they commit in advance to a certain labor income contribution by forecasting their stream of quarterly activity.

³Most of the previous literature has relied on self-reported employment status, which creates measurement bias and makes it difficult to identify the actual amount corresponding to labor earnings.

	All	E (P)	E (T)	SE	NE
<i>Mean</i>					
Age	38.57	38.37	35.75	41.21	37.97
Real Monthly Earnings	1625.63	1698.96	1367.52	964.32	324.85
Tenure (years)	5.25	4.61	1.11	7.97	0.52
<i>Demographics (%)</i>					
Female	45.51	41.02	46.52	31.21	56.40
College	17.78	20.89	20.21	12.18	12.86
<i>Job Status (%)</i>					
Employed Perm (75.13)	47.22				
<i>Public</i>		8.42			
<i>Non-Public</i>		91.58			
Employed Temp (24.87)	16.88				
<i>Fixed-Term</i>			20.12		
<i>Contract of service</i>			75.56		
<i>Training</i>			3.13		
<i>Substitution</i>			1.04		
<i>Other</i>			0.15		
Self-Employed	15.28				
<i>Sole</i>				64.50	
<i>Coop</i>				21.61	
<i>Scorp CEO</i>				7.77	
<i>Family</i>				4.77	
<i>Liberal Prof</i>				0.24	
<i>Dependent</i>				0.09	
<i>Other</i>				1.02	
Non-Employed	20.61				
<i>Unemp. w/ Benefits</i>					30.38
<i>Rest</i>					69.62

Table 1: Summary Statistics

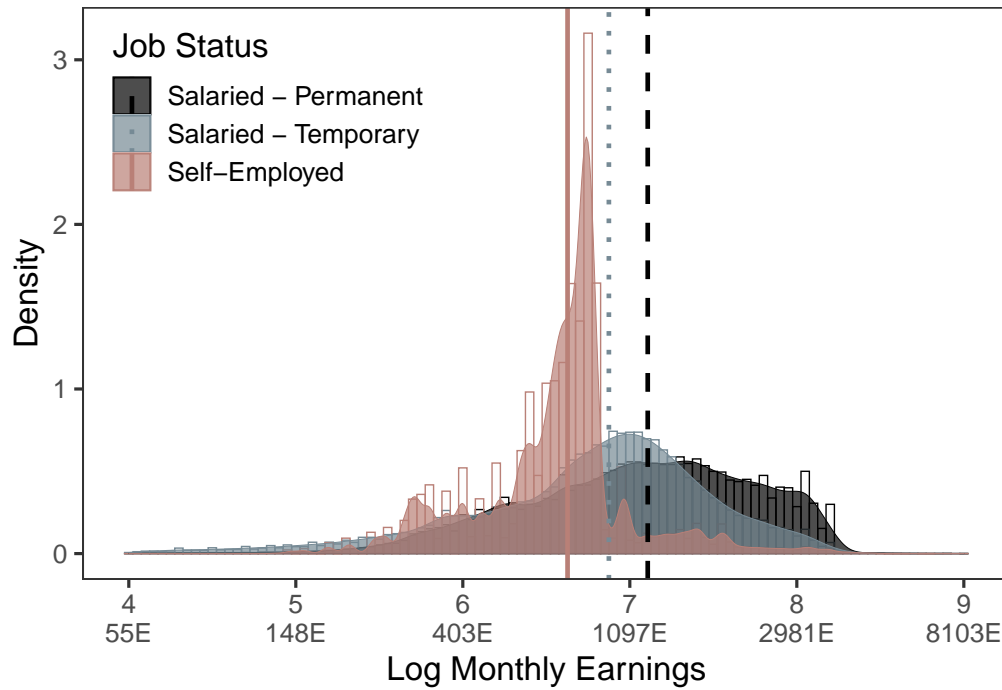
3 Self-Employment Earnings and Returns Compared to Two Segmented Salaried Markets

In this section, we document three facts regarding earnings and labor market returns in self-employment when workers face higher rates of unemployment, and how these compare to the job alternatives in a segmented salaried market in terms of job protection. First, we look at the cross-sectional earnings distribution and find that earnings in self-employment are lower, but less dispersed than in paid employment. Second, we generate age-earnings profiles based on main job experience at young ages, finding that the earnings of those predominantly in self-employment at young ages grow less over the life cycle, even when returning to salaried work. Third, we estimate the returns to experience using the longitudinal dimension of our data, to find that these are lower in self-employment compared to both permanent and fixed-term salaried jobs.

3.1 Cross-Sectional Evidence: Earnings in Self-Employment are Lower and Less Dispersed

Top panel of Figure 1 depicts the cross-sectional distribution of log monthly earnings for workers in salaried jobs and self-employment. We explicitly separate those in temporary contracts and open-ended contracts. Earnings in self-employment are lower on average and less dispersed. While this still does not say anything about the returns to choosing self-employment, this snapshot is useful to get a glimpse of the large differences in dispersion, particularly compared to workers in temporary contracts, which are the principal kind held by younger cohorts. We next explore whether there are dynamic benefits to choosing self-employment in terms of higher earnings growth.

Figure 1: Log-Earnings Distribution By Employment Status



Note to Figure 1: **Top panel:** Histogram and Kernel density estimates for the cross-sectional distribution of monthly real earnings (in 2006 Euros). Vertical lines denote the median for each distribution of the same color. *x*-axis includes the the corresponding euro amount for ease of interpretation. **Bottom panel:** Main job status as young is defined as predominant status before 40 by number of days. Thick lines are average earnings at each age for all workers with the given main status. Thin lines further limit the sample to those that, independently of their status before 40, are salaried after 40.

3.2 Life-Cycle Dynamics: Earnings of the Young Self-Employment Grow Less over Life

We next focus on how earnings evolve as workers age. We look at average earnings by age of workers based on their main employment status before age 40 in the bottom panel of Figure 1. Interestingly, a first look at the dynamics of earnings suggests that self-employment experience is not compensated over time when compared to that of workers predominantly in paid-employment prior to 40 years old.

Workers who spend most of their young lives in self-employment or fixed-term contracts perform worse than workers with highly-protected contracts at every year of their lives. Those mainly self-employed before age 40 perform similarly to workers under fixed-term contracts early in the career but worse thereafter. To shed light on the differences between temporary and self-employment workers, we zoom in on the earnings after 40 for only those workers that ended up in paid-employment after 40. Conditional on having a salaried contract after 40, the gap is even larger with close to 5000 euro difference on average at age 50.

Overall, 78% of predominantly self-employed workers before age 40 are still self-employed at age 50, while only 25% of those predominantly fixed-term before age 40 are still under fixed-term employment at age 50. Instead, 57% have managed to obtain a permanent contract, but the don't fear as well as those that started their career in a stable, permanent job. 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 unobserved characteristics from worker's labor histories to alleviate the selection effect and composition of different groups of workers.

3.3 Longitudinal Evidence: Returns to Experience and Seniority are Lower in Self-Employment

We exploit the longitudinal dimension of our dataset and 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 growth differ-

ences across workers. In particular, we use following reduced-form Mincer equation of earnings determination:

$$y_{i,t} = \mu_i + E_{i,t}\beta_1 + T_{i,t}\beta_2 + X_{i,t}\beta_3 + \xi_{it} \quad (1)$$

The dependent variable in equation 1 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 40:⁴ predominantly permanent, temporary, and self-employed. We construct experience in the dataset using the difference between the first year of entry of the worker in the labor market and the current year. Tenure is defined 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.⁵ We cluster standard errors at the individual level.

Young Status	Years of experience			
	2	5	10	15
Predominantly temporary before age 40	0.31	0.58	0.74	0.78
Predominantly self-employed before age 40*	0.14	0.28	0.38	0.42
Predominantly self-employed before age 40**	0.21	0.39	0.50	0.56

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

Table 2: Estimated cumulative returns to experience

Table 2 summarizes the estimated returns to experience for different groups based on years of labor market experience.⁶ We find that those workers predominantly in temporary employ-

⁴We look at individual's histories from age 22 or first entry onwards. In our baseline specification we require to observe at least 365 days of labor history between age 22 and 40 to be in the sample.

⁵Because some older spells lack industry information, we also run the same specification without including a control for industry, finding very similar results

⁶We focus on returns to general labor market experience and present the full specification estimates, including returns to tenure, in the Appendix.

ment 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. This is somehow not surprising, and reconciles the findings in the literature that self-employment experience does not reward workers in terms of earnings later in life. However, we have abstracted so far from lifetime earnings risk and uncertainty, and how self-employment, could be a successful option to escape labor market duality, earnings risk, and unemployment when their prevalence is at its highest—i.e., between 20 and 40 years old. We explore potential mechanisms at play in the next section.

4 Potential Explanations

In this section we relate the findings presented in the previous sections with some theoretical explanations in the literature, testing these hypothesis against the data to shed light on the mechanisms driving these facts.

4.1 Candidate Mechanisms

4.1.1 Measurement Issues and Non-Pecuniary Benefits

Many papers document the existence of large non-pecuniary benefits from self-employment ([Hamilton, 2000](#)) and of intangible capital such as sweat equity ([Bhandari and McGrattan, 2020](#)), to reconcile the observed transitions into self-employment. We do not rule out this possibility, as we cannot identify this channel in our dataset that focuses on the labor side of self-employment. Instead, we focus on mechanisms we can test and leave the interpretation of the results as possibly in addition to non-pecuniary benefits. More broadly, past literature has documented that business owners and the self-employed tend to under-report their income ([Hurst, Li and Pugsley \(2014\)](#); [Lagakos et al. \(2018\)](#)). [Bhandari et al. \(2020\)](#) document the large differences in US business income coming from a variety of surveys relative to tax records. We try to overcome these issues in two ways. First, our data comes from social security records, which improves the quality upon survey data. While it might still be the case that the self-employed under-report their income to the social security administration, we do not think this is the case in the SSSA, as the future retirement pension and other benefits, such as maternity leave, of the self-employed in Spain are linked to

the present contributions. Hence, the self-employed workers have incentives to report an accurate number. Second, we further test the robustness of our results when possible by focusing just on salaried income after a self-employment spell. The thin lines in the bottom panel of Figure 1 limit the sample to those that, after the age of 40, only hold salaried jobs. We show that our result that the young-self-employed are stuck on slower earnings growth compared to both salaried markets still holds.

4.1.2 Negative selection in self-employment

Our observed results that the self-employed earn on average less than the salaried could be explained by a negative selection, both by observed and unobserved characteristics, into self-employment. [Evans and Leighton \(1989\)](#) document that unemployed and workers in the lower tail of the salaried employment distribution are more likely to enter self-employment. More recently, [Humphries \(2018\)](#) shows that non-incorporated self-employed exhibit lower cognitive and non-cognitive ability compared to incorporated entrepreneurs. We find some evidence of negative selection, as presented in Table 1. The self-employed have on average lower educational attainment than salaried workers, and are mainly composed of sole proprietors and cooperative workers, so one could argue that the flatter age-earnings profiles presented in the bottom panel of Figure 1 are driven by the composition of the workforce. In order to further inspect the role of unobserved heterogeneity, the longitudinal analysis in section 3.3 estimates equation (1), controlling for individual fixed-effects and observed characteristics of workers, achieving similar conclusions.⁷

4.1.3 Search frictions and earnings growth through job shopping

An important strand of the literature has studied the contribution of job shopping to earnings and wage growth (understood as hourly or daily earnings). Ex-ante identical workers receive different employment opportunities that they use to bargain over higher wages, generating wage growth and dispersion (see, for instance, [Postel-Vinay and Robin \(2002\)](#); [Bagger et al. \(2014\)](#)). The evidence presented so far in this paper suggests that we can rule out the existence of job shopping once in self-employment, as we observe low turnover and earnings growth for the self-employed.

⁷We acknowledge that this approach does not deal with the selection characteristics that drive a worker into self-employment and are unobserved by the econometrician.

The innate search frictions in dual labor markets with high firing costs could explain why we do not observe workers in short-term self-employment spells transitioning frequently back to paid-employment. This is not the case in labor markets with relative lower search frictions, such as the United States, where the literature has documented that many workers use self-employment as experimentation to go up the paid-employment job ladder (Daly, 2015; Manso, 2016).

4.1.4 Return-(unemployment) risk trade-off

This theory states that workers in riskier jobs should be compensated with higher static and life-time labor earnings. This idea was first introduced by Smith (1776) in "The Wealth of Nations" as a compensating differentials explanation to wage dispersion. More recently, Cubas and Silos (2017) find a positive correlation at the occupation level between earnings and occupation risk and average wages. Dillon (2018) finds an important role of earnings and employment risk in sorting workers across occupations: more risk averse workers sort into occupations that entitle less risk and are willing to give up a sizable amount of lifetime earnings to reduce the uncertainty surrounding their career.

We first test this hypothesis on raw aggregate evidence. We find higher unemployment risk in paid-employment relative to self-employment. This is remarkably true compared to both kinds of labor markets in terms of job protection. In the left panel of Figure 2, we consider monthly transitions between paid-employment—differentiating between permanent and fixed-term employment—, self-employment, and unemployment. We show that the self-employed have the lowest probability of entering unemployment among the employed, and also exhibit higher status persistence. This contrasts with the separation rate of fixed-term workers, who enter unemployment at a monthly rate above 5 percent. This simple matrix illustrates the higher unemployment risk faced by the employed in a dual labor market.

We further illustrate the unemployment risk faced across different employment status by examining the tenure distributions of workers. In the right panel of Figure 2, we observe that the self-employed tenure distribution has a higher right mass compared to both types of paid employment. As fixed-term employment has a legal maximum duration of two years on average, most workers in this type of contract enjoy spells that last less than a year. On the other hand, there is an important mass of self-employed whose businesses last for more than 10 years. Overall, we

find, in contrast to studies in labor markets with lower employment duality and unemployment risk, that self-employment is a long-lasting employment option, insuring workers against higher unemployment risk present in paid-employment.

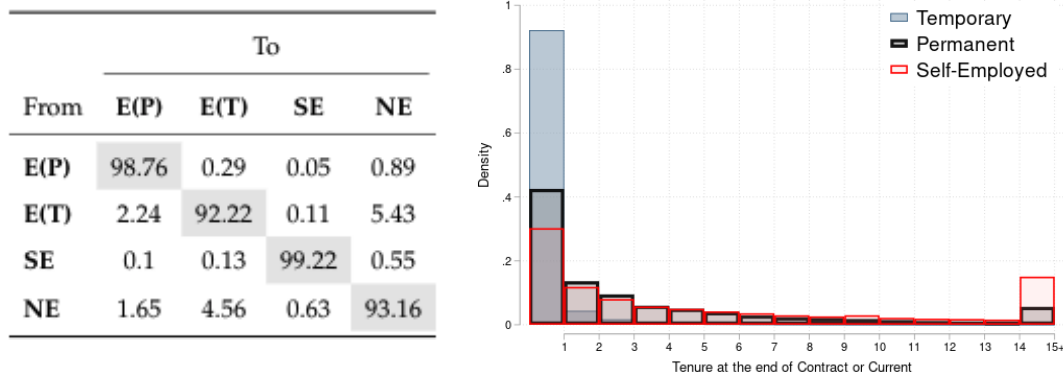


Figure 2: Monthly transition probabilities (left) and tenure in years by job status (right)

Note to Figure 2, left panel: Share of workers in status x last month that transitioned to status x' this month, where x are rows and x' are columns. **E(P)** denotes paid-employment in a permanent contract, **E(T)** denotes paid-employment in a temporary contract, **SE** denotes self-employment, and **NE** denotes unemployment with benefits and non-employment spells. *Note to Figure 2, right panel:* Distribution of tenures at the end of a contract or current tenure if spell is ongoing.

Finally, we may think that these aggregate results are driven by composition effects. [Garcia-Cabo and Madera \(2019\)](#) in a companion policy paper, calculate survival rates into unemployment from self-employment, confirming the robustness of the aggregate evidence presented in this section after controlling for workers' characteristics.⁸ We next turn to an analysis of lifetime earnings profiles to test the hypothesis of whether those predominantly in self-employment face lower idiosyncratic lifetime income risk.

4.2 Earnings Risk Dynamics and Entry into Self-Employment over the Life Cycle

To further test our preferred hypothesis—that self-employment is the least risky option in terms of earnings uncertainty over the life cycle, making it desirable despite the lower returns—we decompose the dynamics of earnings into ex-ante individual heterogeneity, persistent uncertainty, and transitory uncertainty. For this purpose, we estimate a workhorse model of earnings dynamics over the life cycle. Importantly, we allow for the parameters of the statistical model to vary by age, following [Karahan and Ozkan \(2013\)](#).

⁸They present the following takeaways: 1) The probability of entering unemployment for the average worker is higher from paid-employment than from self-employment. 2) This probability of entering unemployment is higher for women, the young, and the old. 3) Higher educated people enjoy longer spells.

In particular, we first calculate the residual earnings after controlling for observed heterogeneity. We then decompose residual earnings into an individual fixed effect, that can be interpreted as unobserved ex-ante heterogeneity in workers' ability, and a permanent and transitory shock. The latter part can be thought of as uncertainty or earnings risk, which is the object of interest. We then compare the persistence and variance of these shocks across groups based on labor status. To exploit the panel structure, we assign a lifetime job status to each person based on the predominant type before 40 years old. Formally, we estimate the following equation from earnings data:

$$\begin{aligned}\tilde{y}_h^i &= \alpha^i + z_h^i + \epsilon_h^i \\ z_h^i &= \rho_{h-1} z_{h-1}^i + \eta_h^i\end{aligned}\tag{2}$$

where \tilde{y}_h^i denote residual earnings for worker i at age h and time t after controlling for observables.⁹ We decompose the residual \tilde{y}_h^i as the sum of a fixed effect α^i , a persistent z_h^i component, and temporary component ϵ_h^i . We further assume that the persistent component follows an AR(1) process with auto-correlation parameter ρ and variance σ_η^2 and captures long-lasting changes in earnings. The transitory shock has variance σ_ϵ^2 , and captures measurement error and temporary changes in annual earnings. We refer to [Karahan and Ozkan \(2013\)](#) for further details on the specification and identification of the parameters.¹⁰

We estimate α , ρ^h , $\sigma_{\eta_h}^2$, and $\sigma_{\epsilon_h}^2$ using Generalized Method of Moments. In particular, we minimize the distance between empirical variances and co-variances from the data by age $cov(\tilde{y}_h^i, \tilde{y}_{h+n}^i)$, and the theoretical counterparts derived from the model summarized by equation 2. We target a non-parametric specification, without imposing a specific functional form in the earnings process. This leaves us with 196 moments and 93 parameters to be estimated for each group. We present the results in [Figure 3](#), highlighting the importance of taking into account age variant profiles when studying earnings dynamics.

We observe that at early ages shocks are moderately persistent, as previously found for the United States by [Karahan and Ozkan \(2013\)](#). This is true for all groups, but especially for the self-employed. In order to interpret persistence estimates, we compare the number of years that

⁹Specifically, we run a first stage $\log Y_{h,t}^i = \beta X_{h,t}^i + \tilde{y}_h^i$, where $X_{h,t}^i$ contains a quartic polynomial in age, educational attainment, worker's region fixed-effects, and year dummies.

¹⁰We follow their identification strategy and normalize $\rho_1 = \rho_2$ and $\sigma_{\eta_H}^2 = \sigma_{\eta_{H-1}}^2$. In our setting, we abstract from the time-varying loading factors and capture the aggregate dynamics with year dummies.

a shock received at different ages takes to fade away. If a shock is received at age 30, 64 and 73 percent of its effect dissipates within 5 years for those mainly in permanent and temporary employment, respectively. The shock is less persistent for those mainly self-employed, as 90 percent of a shock received at age 30 dissipates within five years. Persistence increases as workers age. For instance, if the shock is received at age 40, only about 44 percent fades away after 5 years for permanent and self-employed workers, and 38 percent for those mainly in temporary employment. Persistence at later ages stabilizes for permanent and self-employed workers, but keeps increasing late until late in life for those in temporary contracts, reaching its peak close to 50. We next turn our attention to the variances.

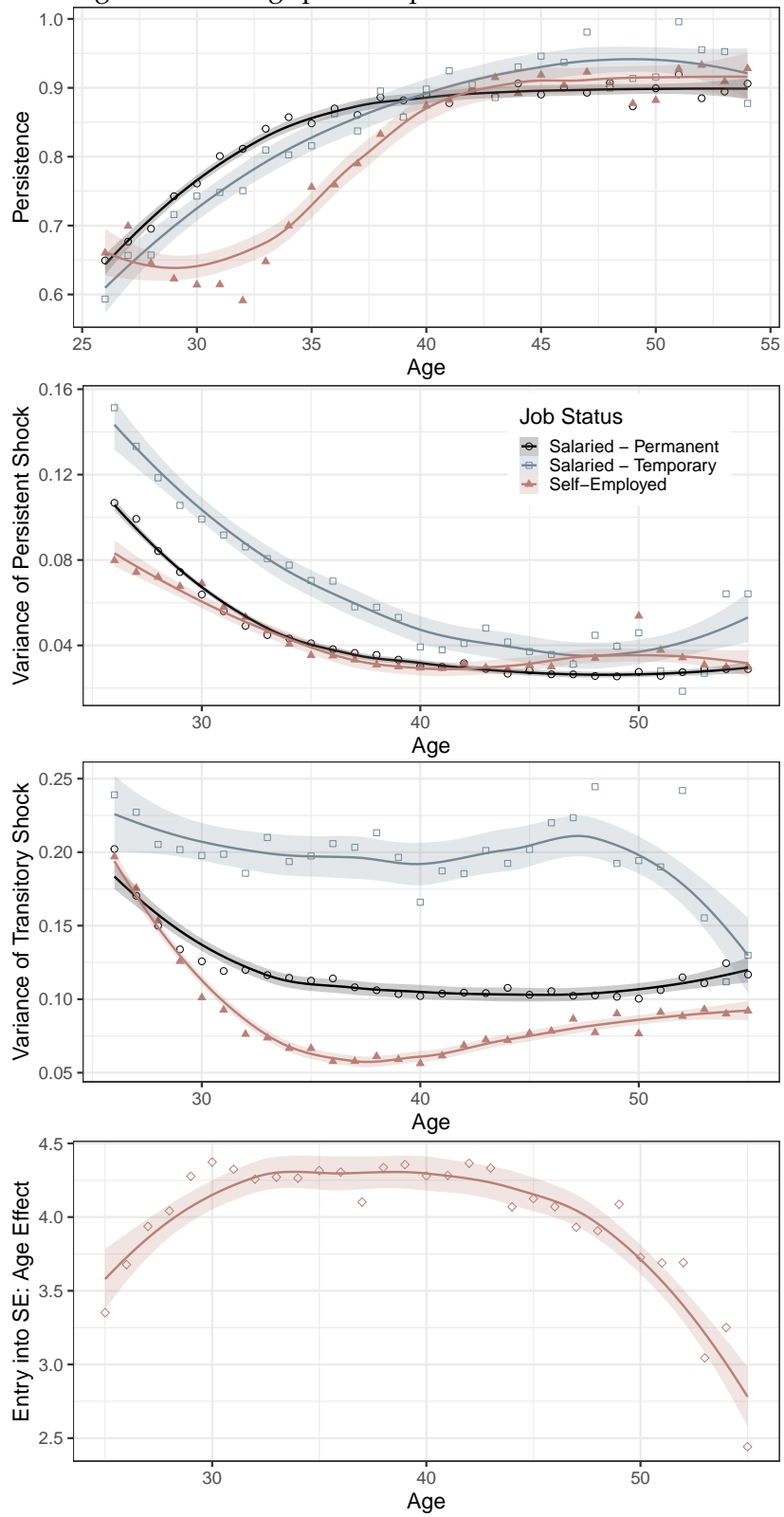
In the case of persistence shocks, we observe that the variance declines between ages 25 and 35, and plateaus afterwards for all workers, with a small but not significant increase towards the end for those in temporary employment. Overall, this variance is higher over the lifetime for workers employed predominantly in temporary jobs compared to the other groups, suggesting more variability across workers in their labor market outcomes. Combining the results from the first two panels results in even larger risk advantage for the self-employed, as even a smaller difference with respect to the salaried is greater given the persistence estimates higher in both salaried markets.

The variance of temporary shocks is three times as high for workers mainly in temporary contracts compared to those mainly in self-employment. This is not surprising, given 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. Moreover, despite the stability of highly-protected jobs, the variance of transitory shocks is also higher than for those in self-employed.

It remains to be shown that there is a link between these uncertainty patterns and entry into self-employment. While a causal study is beyond the objective of this paper, we do include in the fourth panel of Figure 3 the estimated age effects of entering self-employment from any alternative job status, including self-employment. We control for cohort and age effects, following the restricted year effects approach from [Deaton and Paxson \(1994\)](#). We then rescale the fixed effects to the value of the omitted category (age = 26). The resulting profile can thus be interpreted as the average entry rate into self-employment, net of cohort and year dynamics. ([Evans and Leighton, 1989](#)) document that entry into self-employment in the United States is flat. In contrast to the case of the United States, we document that entry is hump-shaped, with the increasing years coincid-

ing with those where persistent and the variance of shocks is the lowest compared to salaried options, especially compared to those in unstable salaried options.

Figure 3: Earnings profiles: persistence and variances



Note to Figure 3: Markers denote point estimates in non-parametric regression using dummies. Smoothed profiles (solid lines) are calculated using LOWESS regressions, with bandwidth set to 0.8.

5 Discussion and Conclusion

This paper analyzed the role of earnings risk in reconciling the observed lower earnings returns in self-employment relative to paid-employment in the context of 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 return-risk trade-off in life-cycle earnings both in self-employment and the salaried alternatives. We compare the cross-sectional distributions and life-cycle of earnings, both for (log) levels and for the risk components of earnings. We conclude that, provided there are riskier forms of paid-employment, such as the case of temporary contracts in Spain, earnings risk in self-employment are not necessarily lower than in paid employment, as often assumed in the notion of entrepreneurial risk.

The evidence and estimates presented in this paper can be used to discipline structural models to study policy reforms, through the use of government active labor market policies to reduce unemployment and increase job stability of both paid-employees and the self-employed. We show that differential unemployment risk within paid-employment becomes a relevant margin when workers decide among employment alternatives. Failing to account for this channel will lead to overstate the role of entrepreneurial risk and will require to rely on large non-pecuniary benefits to reconcile transitions across labor market states. Reducing unemployment risk can help to alleviate labor market outcomes for those groups of workers that traditionally face high unemployment rates (i.e., females, young workers) and unstable employment. However, it is necessary to take into account the role of negative selection into self-employment: the outcomes described in this paper acknowledge that the median self-employed is not the typical entrepreneur, and hence we should not expect them to be engines of growth and employment creation. By performing welfare comparisons between different policies, researchers can assess the costs and benefits of government intervention through active policies in segmented labor markets. Finally, while we performed the analysis for Spain, our conclusions are not restricted to Southern Europe: the rise of the gig economy has segmented labor markets into high- and low-earnings volatility jobs worldwide.

References

- Bagger, Jesper, Francois Fontaine, Fabien Postel-Vinay and Jean-Marc Robin. 2014. "Tenure, Experience, Human Capital and Wages: A Tractable Equilibrium Search Model of Wage Dynamics." *American Economic Review* 104(6):1551–96.
- Bhandari, Anmol and Ellen R. McGrattan. 2020. "Sweat Equity in U.S. Private Business." *The Quarterly Journal of Economics* .
- Bhandari, Anmol, Serdar Birinci, Ellen R. McGrattan and Kurt See. 2020. "What Do Survey Data Tell Us about US Businesses?" *American Economic Review: Insights* 2(4):443–58.
- Buchinsky, Moshe, Denis Fougère, Francis Kramarz and Rusty Tchernis. 2010. "Interfirm Mobility, Wages and the Returns to Seniority and Experience in the United States." *The Review of Economic Studies* 77(3):972–1001.
- Cubas, German and Pedro Silos. 2017. "Career choice and the risk premium in the labor market." *Review of Economic Dynamics* 26:1–18.
- Daly, Moira. 2015. "The long term returns of attempting self-employment with regular employment as a fall back option." *Labour Economics* 35:26–52.
- Deaton, Angus and Christina Paxson. 1994. "Intertemporal Choice and Inequality." *Journal of Political Economy* 102(3):437–67.
URL: <http://ideas.repec.org/a/ucp/jpolec/v102y1994i3p437-67.html>
- Dillon, Eleanor and Christopher Stanton. 2013. "Self-Employment Dynamics and the Returns to Entrepreneurship." *NBER Working Paper No 23168* pp. 4212–4225.
- Dillon, Eleanor W. 2018. "Risk and Return Trade-Offs in Lifetime Earnings." *Journal of Labor Economics* 36(4):981–1021.
URL: <https://doi.org/10.1086/697475>
- Evans, David S. and Linda S. Leighton. 1989. "Some Empirical Aspects of Entrepreneurship." *American Economic Review* 79(3):519–535.
- Garcia-Cabo, Joaquin and Rocio Madera. 2019. "The Self-Employment Option in Rigid Labor Markets: An Empirical Investigation." *International Finance Discussion Papers, Board of Governors of the Federal Reserve System* (1264).
- Hamilton, Barton H. 2000. "Does Entrepreneurship Pay? An Empirical Analysis of the Returns to Self-Employment." *Washington University* 108(3):604–631.
- Hombert, Johan, David Sraer, Antoinette Schoar and David Thesmar. 2014. "Can Unemployment Insurance Spur Entrepreneurial Activity?" *NBER Working Paper No 20717* .
- Humphries, John Eric. 2018. "The Causes and Consequences of Self-Employment over the Life Cycle." *Job Market Paper* .
- Hurst, Erik, Geng Li and Ben Pugsley. 2014. "Are Household Surveys Like TaxForms? Evidence from Income Underreporting of the Self Employed." *Review of Economics and Statistics* 96(1):19–33.

- Karahan, Fatih and Serdar Ozkan. 2013. "On the persistence of income shocks over the life cycle: Evidence, theory, and implications." *Review of Economic Dynamics* 16(3):452–476.
- Lagakos, David, Benjamin Moll, Tommaso Porzio, Nancy Qian and Todd Schoellman. 2018. "Life Cycle Wage Growth across Countries." *Journal of Political Economy* 126(2):797–849.
- Manso, Gustavo. 2016. "Experimentation and the Returns to Entrepreneurship." *Working Paper* .
- Ocampo, Sergio and Juan Herreño. 2020. "Self-employment and development." *CHCP Working Papers Western University* (2020-9).
- Postel-Vinay, Fabien and Jean-Marc Robin. 2002. "Equilibrium Wage Dispersion with Worker and Employer Heterogeneity." *Econometrica* 70(6):2295–2350.
- Smith, Adam. 1776. *The Wealth of Nations*.
- Topel, R. H. 1991. "Specific Capital, Mobility and Wages: Wages Rise with Job Seniority." *Journal of Political Economy* 99(1):145–176.