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Labor Market Policies and Self-Employment Transitions of Older Workers*

Dimitris Christelis†, Raquel Fonseca‡

Résumé/abstract

We study transitions in and out of self-employment of older individuals using internationally comparable survey data from 13 OECD countries. We compute selfemployment transitions as conditional probabilities arising from a discrete choice panel data model. We examine the influence on self-employment transitions of labor market policies and institutional factors (employment protection legislation, spending on employment and early retirement incentives, unemployment benefits, strength of the rule of law), as well as individual characteristics like physical and mental health. Selfemployment is strongly affected by government policies: larger expenditures on employment incentives impact it positively, while the opposite is true for expenditures on early retirement and unemployment benefits.

Mots clés/keywords : self-employment, transitions, ageing, labor policies, panel data

Codes JEL/JEL Codes : J21, J24, C4

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1. Introduction

The prevalence of self-employment varies widely across countries, e.g. it is quite higher in Southern Europe than in Northern Europe. Furthermore, self-employment becomes more common with age, partly because it provides older workers with opportunities not found in traditional salary jobs, such as flexibility in working hours. This is particularly important because older workers may have different preferences for leisure than younger ones, as well as for a more gradual retirement path. Self-employment may also facilitate such a retirement path, (see Quinn, 1980, and Fuchs, 1982), which can be of interest to policy makers who aim to boost working at older ages.

Hence, the effect of labor market policies on self-employment in older age merits further investigation. However, while there is a large literature that compares different self-employment rates across countries[2], there are few studies that focus on transitions in and out of self-employment of older workers, and on how labor market policies affect such transitions. Zissimopoulos et al. (2009) examine the role of incentives related to private pensions and public health insurance on the retirement patterns of wage earners and the self-employed in the US and the UK, using data from the Health and Retirment Study (HRS) and the English Longitudinal Survey of Ageing (ELSA). Furthermore, Zissimopoulos and Karoly (2007) study the role of wealth and health in transitions related to self-employment in the US using the HRS.

Cross-country comparisons of self-employment patterns of older workers are also rare. One exception is Hochguertel (2005), who examines the role of institutional and

[2] See e.g. Blanchflower and Oswald (1998), Blanchflower (2000), Parker (2004), and Hyytinen and Rouvinen (2007).

demographic factors on the prevalence of self-employment in 11 European countries using data from the Survey of Health, Ageing and Retirement in Europe (SHARE). In addition, Fonseca et al. (2007), using data from HRS, ELSA and SHARE study the effect of liquidity constraints on entrepreneurship. Carrasco and Ejrnæs (2003) examine institutional factors such as the generosity of the unemployment benefit system and child care policies in two countries, namely Spain and Denmark, which have a high and a low prevalence of self-employment, respectively. Carrasco and Ejrnæs estimate transitions into self-employment in the population using logit models for both women and men, conditional on their previous labor market status. They find that differences in the generority of unemployment benefits are indeed associated with differences in labor market dynamics between the two countries. Most of the available studies on the self-employed, however, are country-specific.[3]

Our contribution in this paper is to analyze the effect of labor market policies on transitions in and out of self-employment of older workers in 13 OECD countries, using data from SHARE, HRS and ELSA. Data on both labor market policies at the country level and on self-employment policies at the individual level are harmonized across countries, and hence meaningful cross-country comparisons can be made. The labor market policies that we examine include employment protection legislation, early retirement and employment incentives, unemployment benefits and the rule of law (see also Torrini, 2005).

In contrast to previous work on self-employment transitions, we use an empirical

[3] See, for example, Bruce et al. (2000), who find that government incentives in the last decades have affected the occupational choice of older workers in the US. The relationship between social security generosity and self-employment transitions is also examined in Carrasco (1999) for Spain, and Been and Knoef (2012) for the Netherlands, among others. Other examples include Quinn (1980), Fuchs (1982), Bound et al. (1999), Bruce et al. (2000), Giandrea et al. (2008) for the US economy

methodology that allows us to compute transitions in and out of self-employment in older age as conditional probabilities arising naturally from a discrete choice panel data model that takes into account selectivity in the sample of older workers, as well as the autocorrelation of all time-varying unobservable factors present in the estimating equations. Hence, using this model we are able to study how self-employment transitions are affected by the aforementioned country-level institutional factors as well as by individual-level characteristics.

We find that self-employment transitions are strongly associated labor market policies: increased expenditures on employment incentives affect make it more likely that older age individuals will become self-employed, while the opposite is true for expenditures on early retirement and unemployment benefits. In addition, employment protection legislation favors self-employment, as it makes it more difficult to find a job as a salaried worker. We also find that self-employment is negatively associated with the rule of law, probably due to the fact that the self-employed can benefit from weak law enforcement more than salaried workers. Finally, we find that entering and remaining into self-employment is facilitated by good physical and mental health, and hindered when one is female or has grandchildren.

The structure of the paper is as follows: In Section 2 describes our data, while Section 3 discusses the estimation methodology. We present our empirical results in Section 4, while Section 5 concludes.

2. Data and empirical overview

2.1. Data

The empirical analysis in this study is based on three datasets: the HRS for the U.S., ELSA for England and SHARE for 11 European countries.[4] These surveys consist of representative samples of the population aged fifty and above in all countries. The data used in this study are taken from waves 7 and 8 of the HRS, waves 2 and 3 of the ELSA, and waves 1 and 2 of the SHARE.[5] The first wave in each survey was conducted in 2004-2005 while the second in 2006-2007. Importantly, these three surveys have been to a large extent harmonized with respect to their questionnaire. As a result, they provide harmonized data on our variables of interest, namely those on employment, and on various demographics and economic characteristics.

In addition, we also use variables related to labor market policies such as employment protection laws, and labor incentives that are taken from OECD and World Bank datasets. We describe all the variables in more detail below.

In our analysis we restrict our sample to those aged 75 or less, as individuals older than 75 are very unlikely to be working in any capacity or to transition into self-employment. The basic statistics of the sample we use in the estimation are reported in Table 1, which summarizes demographic variables (education, age, gender, marital status, number of children and grandchildren) and physical and mental health variables (self-reported health, depression and the score on an immediate recall test) that have been found in existing literature to affect self-employment transitions. We choose to use in our

[4] We include the countries that are present in the first two waves of SHARE, namely Sweden, Denmark, Germany, the Netherlands, Belgium, France, Switzerland, Austria, Italy, Spain, and Greece. There is one additional comparable SHARE wave that took place after 2007 (namely the fourth one of 2010-11), as well as HRS and ELSA waves that took place in 2008 and 2010. However, the recent financial crisis may affect our analysis by inducing differential occupational transitions and increases in unemployment rates across countries. Incorporating these effects is, however, potentially informative on its own, and thus we leave it for further research.

[5] The third SHARE wave, also known as SHARELIFE, is a retrospective survey that has a very different questionnaire than the previous two waves. Hence, we cannot use SHARELIFE in our analysis.

specifications only variables that are less likely to be endogenous to the self-employment decision.

We note that about 45% of individuals in our sample are working. There are large differences, however, in inactivity rates across countries, as can be seen in Table 2, which also shows that self-employment rates differ markedly also by gender. In the Mediterranean countries, Austria and Belgium two thirds or more of the population are not working, while less than a half of the population is inactive in the US, Sweden, Denmark, and Switzerland. Conditional on working for pay, we note that the percentage of the self-employed also varies considerably across countries, being quite higher in Southern Europe than in Northern Europe. In England, Sweden, Denmark, Germany, the Netherlands, France and Austria the share of the self-employed among all workers is 18% or smaller, while in the US, Belgium and Switzerland this share is between 19% and 26%. Finally, it is equal to 44% in Greece, 36% in Italy, and 28% in Spain. Interestingly, in the Netherlands and Austria women exhibit a slightly higher prevalence of self-employment than men. Countries where the differences in self-employment rates across genders are less than 7 percentage points include Spain, France, Belgium, Germany and Denmark. On the other hand, higher differences in the prevalence of self-employment across genders exit in the US, England, Sweden, Switzerland, Italy and Greece.

2.2. Factors Affecting Self-employment Transitions

Tables 3 and 4 show transitions in occupational status that are observed in our data. When we compute transition probabilities from period t to period $t+1$ for different occupational choices (shown in Table 3), we find that conditional of being self-employed in the first period, there is a 70.7% chance of remaining self-employed in the next period while there is a 20.9% chance of leaving work altogether. Switching from salaried employment in the first period to self-employment in the next period has a probability of 2.31%. Conditional on not working in the first period, there is only a 1.61% chance to become self-employed in the next period. We find that conditional of being self-employed in the first period, the chance of remaining self-employed in the next period is about 74.6% for men and about 63.9% for women. Except for the probability of staying self-employed from one period to the next, the rest of transitions in and out of occupations are similar between men and women.

Table 4 shows occupational transitions by country. The countries with higher transitions from self-employment in period t to also self-employment in period $t+1$ are France (81.5%), Belgium (79.1%), Greece (75.3%) and the US (73.6%). The countries with the lowest such transitions are Sweden and Spain. However, the countries where the switching from salaried employment period t to self-employment in period $t+1$ are more likely are Sweden (3.9%) and Spain (3.7%). Transitioning from self-employment into not working is high in Austria, Italy and Spain. We find that countries where becoming a salaried worker in period $t+1$ conditional on being a self-employed worker in period t is more likely are Sweden and Denmark, while the lower rates of such transitions are observed in Greece (2.6%) and Belgium (5.1%).

Turning now to factors that can affect self-employment transitions, we first examine factors that refer to labor market policies. These include employment protection laws, spending on labor market incentives (for employment, unemployment benefits, and early retirement), expressed as the share of GDP devoted to such expenditures in each country. The relationship of these factors to self-employment rates (but not to transitions into and out of self-employment) has been examined in a number of previous studies.[6] The objective of this study is to see whether they can also shed light into the transition from salaried work to self-employment as well as to the transition from self-employment to retirement.

We use information on the aforementioned variables that is provided by the OECD at the country level (e.g. incentives on early retirement, again expressed as a share of GDP), except for a variable that denotes the prevalence of the rule of law that is taken from the World Bank database. Existing literature suggests that the rule of law affects various parts of the economy as well as entrepreneurship in particular (see Djankov, La Porta, Lopez-De-Silanes, Shleifer, 2002 and Aides et al., 2009).

Table 4 displays the correlations between working and self-employment with the five institutional variables used on our empirical specifications. There is a positive correlation between the rule of law and working in any capacity and a strong negative correlation with self-employment conditional on working. The same pattern is found with incentives for employment. Stronger employment protection laws (EPL) have a negative correlation with working but a positive one with self-employment. Higher unemployment benefits are slightly negatively correlated with working in any capacity and also negatively correlated with self-employment, and a similar pattern exists with respect to incentives for early retirement.

Self-employment is also correlated with a number of demographic characteristics. As can be seen in Figure 1, and as already mentioned, the share of the self-employed

[6] See e.g. Torrini, 2005; Parker and Robson, 2004; OECD, 2000). In particular, employment protection laws seem weakly correlated with self-employment rates (see Torrini, 2005; Robson, 2003). See also Carrasco (1999), and Carrasco and Ejrnæs (2003) for the case of unemployment benefits.

among those working rises with age. Several studies have already discussed this empirical pattern (e.g. Blanchflower, 2000, Hochguertel, 2005), and different explanations for it have been proposed. For example, one reason why self-employment becomes more common with age could be the fact that it has features that are valuable to older workers and that are not found in traditional salaried jobs, e.g. flexibility in working hours.

The effect of health in employment can be very important given that older individuals experience significant changes in their health, and given that self-employment is particularly sensitive to health status (see Bound et al., 1999; Zissimopoulos and Karoly, 2007; Parker and Rougier, 2007). We use the subjective self-reported health status as an indicator of the health status of our sample respondents. Self-rated health was measured by asking respondents to rate their health on a five-point scale: excellent, very good, good, fair, poor. We define a binary variable denoting bad health, which takes the value of one if the self-rated health is fair or poor, and zero otherwise.

We also check the effect of cognition on self-employment by using the score on an immediate recall test[7]. Given that there is empirical evidence that points to the importance of mental health in labor market transitions (Thomas et al., 2005, and Repetti et al., 1985, for women), we include an indicator for whether the person is feeling depressed. Finally, we also include in our empirical specifications variables denoting being in couple, the number of children and grandchildren and education. We break education into three levels, namely less than high-school, completed high-school and at least some post-secondary education.

[7] Interviewees are read ten words and are then asked to repeat them. The score in the test equal to the number of words correctly recalled.

3. Empirical Methodology[8]

3.1. Methodologies applied to estimate transition probabilities in discrete choice models

There are several approaches that have been used in the literature to estimate occupational transition probabilities. One approach is to start with a sample of working individuals, and then define a binary variable that takes the value one if self-employed and zero otherwise. This approach is problematic, however, as it starts with a potentially very selected sample, i.e. those who work; the problem of selectivity would be particularly severe when examining older individuals, as those who work in older age are likely to be quite different from those who do not.

An alternative approach would be to use the whole sample (i.e., the self-employed, the dependent workers and the retired) in a panel setting. Then for each employment status there would be several transitions out of and into it, and the estimation could in principle be done with a multinomial logit using each transition type as a different outcome. However, some of the transitions would be irrelevant for some categories of employment. For example, a transition from wage labor at time t to self-employment at $t+1$ would be irrelevant for those who are self-employed at period t. This irrelevance implies that there is no possibility to choose some of the outcomes in each period, which would be a violation of the assumptions of the multinomial logit.

[8] This section is based on Christelis and Fonseca (2015).

One could also study self-employment transitions by using a lagged dependent variable in simple probit/logit or multinomial logit models. This would require, however, the availability of at least three longitudinal waves. Furthermore, a lagged dependent variable does not always warrant inclusion in a panel specification, and can create additional problems in estimation.

Finally, one could also use a nested logit, but one of the assumptions in such a model would be that unobservables of choices in different nests are uncorrelated with each other, which is a rather implausible assumption in our context.

In order to address the above issues, we use the empirical model in Christelis and Fonseca (2015), which allows us to compute transitions as conditional probabilities naturally arising from a discrete choice panel data model. Importantly, this model takes into account selectivity in the sample of older workers, and uses the autocorrelation of all time-varying unobservable factors to construct the transition probabilities. Given that this model does not require the use of a lagged dependent variable, it can also be used if one has only two panel waves available, as is the case with our study.

3.2. Empirical strategy

Our approach to the problem with estimating transitions starts from the specification of the individual's decision problem. We posit that the individual first chooses whether to work or not, and then, conditional on working, chooses whether to be self-employed or a wage worker. In the first stage equation corresponding to the decision to work in any capacity or not work at all there is a latent variable y_t^{1*} that is modeled (for individual i) as follows:

$$y_{i,t}^{1*} = \boldsymbol{X}_{i,t}\beta + c_i^1 + \varepsilon_{i,t} \tag{1}$$

where $\boldsymbol{X}_{i,t}$ denotes a vector of control variables, c_i^1 a random effect, $\varepsilon_{i,t}$ is a time varying noise term that is normally distributed, and *t=1,2*. We assume that $\varepsilon_{i,t}$ is autocorrelated with correlation coefficient ρ_ε, i.e.

$$\varepsilon_{i,t+1} = \rho_\varepsilon \varepsilon_{i,t} + u_{i,t+1} \tag{2}$$

where $u_{i,t}$ is distributed normally with mean zero. As is customary in probit models, we need to normalize one error term, and thus we choose to put the variance of $u_{i,t}$ equal to one. As a result, the standard deviation of $\varepsilon_{i,t}$ is equal to $SE(\varepsilon_t) = 1/\sqrt{(1-\rho_\varepsilon{}^2)}$. There is an observed binary variable $y_{i,t}^1$ that takes the value of one if the latent variable $y_{i,t}^{1*}$ is greater than zero, and is equal to zero otherwise.

Furthermore, there is a latent equation for the second stage variable $y_{i,t}^{*2}$ denoting the propensity to be self-employed, which is as follows:

$$y_{i,t}^{2*} = \boldsymbol{Z}_{i,t}\gamma + c_i^2 + v_{i,t} \tag{3}$$

$\boldsymbol{Z}_{i,t}$, c_i^2 and $v_{i,t}$ are defined analogously with the first stage equation. There is again a binary variable $y_{i,t}^2$ that is equal to one when $y_{i,t}^{*2}$ is greater than zero, and is equal to zero otherwise. Crucially, $y_{i,t}^2$ observed only when $y_{i,t}^1$ is equal to one. In other words, the decision to be self-employed or a wage worker is relevant only on the condition that individuals are working. If $y_{i,t}^2 = 1$ then individuals are self-employed, while if $y_{i,t}^2 = 0$ individuals are wage/salaried workers. Hence, individuals are working if $y_{i,t}^{1*} > 0$ and are self-employed when both $y_{i,t}^{1*} > 0$ and $y_{i,t}^{2*} > 0$.

We assume that ε_t and v_t are linked through the equation

$$v_{i,t} = \varphi \varepsilon_{i,t} + w_{i,t} \tag{4}$$

where $w_{i,t}$ is distributed normally with mean zero. As was the case with the first stage equation, we normalize the variance of $w_{i,t}$ to one.

Christelis and Fonseca (2015) show how to calculate the likelihood function that incorporates the autocorrelation in (2) and the selectivity in (4). In turn, the formulation of this likelihood function also allows the computation of transition probabilities of any choice of interest. Additional details about the construction of this likelihood function are given in Appendix A.1.

3.2. Self-employment Transitions

For our purposes, what is crucial is that the model generated by (1)-(4) allows the calculation of transition probabilities for the choices of interest. The study of transitions comes naturally out of this setup if one considers that a transition probability is just a conditional probability of an outcome at $t + 1$ conditional on an outcome at t, and this is equal to the joint probability of the two outcomes divided by the marginal probability of the conditioning outcome at time t. The existence of ρ_ε implies that the joint probability is not equal to the product of the marginal probabilities of the two outcomes, and thus the conditional probability does not collapse to the marginal probability of the outcome at $t + 1$.

3.3. Marginal effects

Our model is rich enough to allow us to calculate the marginal effects of our variables of interest on the probabilities of: i) working (unconditional); ii) being self-employed (unconditional); iii) being self-employed conditional on working; iv) being a dependent worker (unconditional); v) being a dependent worker conditional on working; vi) transitioning from not working to working; vii) transitioning from working to not working; viii) transitioning from dependent work to self-employment; ix) transitioning from not working to self-employment; x) transitioning from self-employment to not working; xi) transitioning from self-employment to dependent work.

When calculating the marginal effects on transition probabilities, one can use a couple of formulations of the marginal effect. First, one can calculate the conditional probability for a given value of the forcing variable in both periods, then calculate the same probability for a second value of the forcing variable (again constant across time) and then take the difference of the two conditional probabilities. This calculation is especially useful when one wants to compare indicators of labor market policies that take different values across countries but do not change over time. It is also useful in the case of variables that change very little or not at all over time in our sample of older individuals (e.g. gender, education, number of children). We will call the marginal effect resulting from this calculation a Type I marginal effect.

The second possibility is to calculate the conditional probability using a given value of the forcing variable at t, and another value at $t+1$,[9] and then compare the conditional probability so calculated to a conditional probability where the forcing variable takes the same value in both periods. For example, if one were interested in the effect of health deterioration on the transition from self-employment to not working, one could evaluate the conditional probability of this transition by putting the dummy for bad health equal to zero at t and equal to one at $t+1$, and then compare it with a conditional probability

[9] When calculating the marginal effects of continuous variables, we change their levels by one standard deviation.

where the bad health dummy is equal to zero in both periods. This type of marginal effect (which we call a Type II marginal effect) is especially useful for studying the effects of common changes across countries in labor market policies and institutional factors from one period to the next. These changes could be thought as policy experiments across time. Type II marginal effects are also useful for studying the effects of changes in variables that are likely to change from period to period in our sample, such as being in a couple, bad health, being depressed, the number of grandchildren, cognition One should also note that by calculating the Type II marginal effect we can avoid using in our specification forcing variables defined as changes over time; rather we can work with forcing variables in levels, and just change their values from one period to the other.

We estimate our marginal effects and their standard errors by simulation; the procedure we follow is described in detail in Appendix A.2.

4. Empirical Results

As already mentioned, our model allows us to compute a large number of probabilities of occupational transitions. Due to space limitations, we will focus our attention on the probabilities of: i) working (unconditional); ii) being self-employed (conditional on working); iii) transitioning from working in any capacity to not working at all; iv) transitioning from wage/salaried work to self-employment; v) transitioning from not working to self-employment; vi) remaining self-employed from one period to the next; vii) transitioning from self-employment to not working. For the transition probabilities iii)-vii) we will compute both Type I and Type II marginal effects (already discussed in Section 4). Our aim is to document the associations of labor market policies, institutions and other determinants with self-employment transitions in older age.

We will discuss marginal effects, as coefficient estimates in discrete choice models are very hard to interpret economically, and are in any case identified only up to scale. Before discussing the marginal effects, however, we note that there are two other crucial parameters that are estimated in our model: a) the autocorrelation coefficient ρ_{ε} of the first stage noise term; b) the correlation between the first and second stage noise terms $\rho_{\varepsilon v}$ that denotes selectivity. We find that ρ_{ε} is equal to 0.84 and very strongly significant (p-value = 0.00). This means that there is very strong temporal dependence affecting the noise terms in both equations, and consequently (as discussed in Section 3 and Appendix A.1) conditional probabilities that denote transitions can be quite different from the marginal probabilities of the choice in $t+1$. Furthermore, $\rho_{\varepsilon v}$ is estimated to be equal to -0.538 with a p-value of 0.001, which points to the fact that workers are a selected sample; therefore empirical analyses that truncate the sample based on employment choices may produce inconsistent estimates.

4.1. Static probabilities of working and of being self-employed conditional on working

When we turn to the marginal effects on the unconditional probability of working, (shown in Table 6), it is clear that the variables denoting labor market policies have strong effects in the expected direction: a stronger rule of law and a larger spending for incentives for employment increase the probability of working while stronger employment protection and more generous incentives for early retirement reduce it.

Table 6 also shows the marginal effects on the probability of being self-employed conditional on working, i.e. the probability that, once we know that a person is working, she will be self-employed. These marginal effects show the influence of the variables of interest on self-employment over and above the influence they have on the decision to work or not. We find that three institutional variables matter for this conditional probability of self-employment: large unemployment benefits and a stronger rule of law make self-employment less likely, while the opposite is true for employment protection legislation. Hence, it seems that stronger employment protection legislation hinders salaried employment and thus turns those who want to work to become self-employed. As for the rule of law, it appears that weaker law enforcement is an incentive for becoming self-employed, probably because the self-employed can benefit from such weaknesses more than salaried workers.

Table 6 shows very strong and significant negative effects on working of being a female, in bad health and depressed, and of having more grandchildren. Furthermore, there is a strong negative age gradient as expected. On the other hand, a higher education and higher cognition affect employment positively. As for the probability of being self-employed conditional on working, the age gradient is now positive, which means that once a person is working at this age range, being older increases the chances of being self-employed. This finding is consistent with a pattern of individuals turning to self-employment before they retire completely. Furthermore, being a female lowers the probability of being self-employed, while bad health does not affect it.

4.2. Transitions into and out of self-employment when covariates are considered time invariant

Most of the added value of our econometric model, however, lies in the computation of transition probabilities, as discussed in Section 3. We begin with the Type I marginal effects on the probability of transitioning from (i) working to not working; (ii) not working to self-employment, (iii) from salaried work to self-employment, (iv) from self-employment to self-employment and iv) from self-employment to not working. Given that Type I marginal effects refer to situations in which covariates do not change between periods, the effects of labor market policies in this case should be interpreted as differences among countries exhibiting higher and lower values of the associated variables.

Results in Table 7 suggest that countries with a stronger rule of law exhibit a higher probability of transitioning from any type of work to no work, a lower probability of switching from salaried work to self-employment, and of staying in self-employment. These patterns could be due to the fact that self-employment is much more prevalent in southern European countries where the rule of law is weaker.

In countries where employment protection legislation is stronger, the transition out of work is less likely, which is probably one of the goals of such legislation. On the other hand, employment protection is not in general associated with self-employment, although it increases slightly the probability of transitioning out of it into not working at all. Similarly, countries with differences in spending on employment incentives do not seem to differ with respect to self-employment transition probabilities.

On the other hand, more generous unemployment benefits are negatively associated with self-employment, as countries that spend more on them exhibit lower probabilities of becoming self-employed when not working and of staying self-employed from one period to the next. Finally, incentives for early retirement are associated with a slightly higher probability of transitioning from self-employment to not working.

When examining the associations of demographic characteristics with self-employment, we again examine situations in which the values of these characteristics do not change over time. Hence the interpretation of the marginal effects in this case is the difference in the probabilities of the outcomes among individuals exhibiting different values of these variables.

As expected, age has a strong negative association with being employed, but a very strong positive one with self-employment, conditional on working. In addition, we find that being a female, and in bad health make transitions out of work more likely, transitions into self-employment less likely, and transitions out of it more likely. On the other hand we find no economically significant associations of self-employment with depression, having children and grandchildren, or having a better memory.

4.3. Transitions into and out of self-employment when covariates change over time

We turn now to Type II marginal effects, i.e. marginal effects that are due to a change in the variables of interest from t to $t+1$. Hence, the marginal effects of the country-level labor market policy variables should be now interpreted as indicating what happens on average if those variables change from one period to the next by the same amount in all countries. We show these marginal effects in Table 8.

An increased strength in the rule of law is associated with a higher probability of transitioning from any type of work to no work, lower probabilities of switching into self-employment, and of staying in self-employment. Hence, the negative association of the rule of law with self-employment is present also across time, and not only across countries.

Incentives on employment seem to be particularly effective, as an increase in the share of GDP devoted to these expenditures is associated with lower probabilities of transitioning out of work, higher probabilities of transitioning into self-employment, and lower probabilities of transitioning out of it. On the other hand, and as expected, an increase in the strength of employment protection legislation has exactly the opposite effects.

An increase in the share of GDP devoted to unemployment benefits is negatively associated with self-employment, as it is has a negative effect on the probabilities of becoming self-employed when not working and of staying self-employed from one period to the next.

Incentives for early retirement have strong effects that go in the expected direction, as an increase in the share of GDP devoted to them is associated with more likely transitions out work, less likely transitions into self-employment, shorter spells of self-employment, and higher probabilities of transitioning out of self-employment.

When examining the associations of demographic characteristics with self-employment, we now examine (as opposed to what was done in Section 4.3) situations in which the values of these characteristics change over time. Hence the interpretation of the marginal effects in this case is the average change in the probability of the outcomes when those variables change values by the same amount between periods for all individuals in the sample.

We find that a deteriorating physical and mental health make transitions out of work more likely, transitions into self-employment less likely and transitions out of it more likely. We also find negative associations of having a grandchild with self-employment. On the other hand, a higher cognition is associated with less likely transitions out of work, more likely transitions into self-employment and less likely transitions out of it.

All in all, the picture that emerges from both Type I and Type II marginal effects of both labor market and demographic variables is that they generally go in the expected direction and are economically relevant. Hence, our findings give no obvious indications of severe misspecification problems in our empirical model.

6. Conclusions

In this paper we have studied transitions of older individuals in and out of self-employment in thirteen OECD countries, focusing in particular on the effect of labor market policies and institutional factors on these transitions. To that effect, we have constructed an empirical model that separates the decision to work or not from the decision to be self-employed, while taking into account both the intratemporal and, crucially for the computation of transition probabilities, the intertemporal correlation of the unobservables in both decisions. Furthermore, our model uses the whole sample and the usual static outcomes as dependent variables, while also taking into account the panel nature of our dataset.

Our results suggest that self-employment is strongly affected by government labor market policies. Transitions into self-employment are positively associated with expenditures on employment incentives, while they are negatively associated with the strength of the rule of law and of employment protection legislation, and with expenditure on early retirement incentives and on unemployment benefits.

In addition, our findings suggest that transitions in and out of self-employment are affected by several demographic characteristics in more or less expected ways. For example, good physical and mental health, higher cognition make it more likely that one becomes and stays self-employed, while being a female, and having more grandchildren have the opposite effect.

There is certainly scope for further research on both the empirical and on the theoretical side about the precise ways with which labor market policies and retirement reforms affect self-employment. In particular, models in which individuals' objectives, constraints, and influences by policy variables are explicitly modeled could be useful: for example, for creating a number of counterfactual situations whose differing outcomes could shed light on the effects of policy changes on self-employment. We leave this task for future research.

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Appendix

A.1 Likelihood function and transition probabilities

Clearly, the parameter φ in (4) is the source of the selectivity affecting the self-employment/wage labor decision in the second stage equation (3). Proposition 1 (see Christelis and Fonseca, 2015, for a proof,) establishes the correlations between the unobservables in equations (1) and (3), as well as the variance of v_t:

Proposition 1: The unobservables $\varepsilon_t, \varepsilon_{t+1}, \varepsilon_t, v_{t+1}$ have the following correlations:

a) $Corr(\varepsilon_t, v_t) = \rho_{\varepsilon v} = \varphi/\sqrt{\varphi^2 + 1 - \rho_\varepsilon{}^2}$

b) $Corr(v_{t+1}, v_t) = \rho_v = \varphi^2\rho_\varepsilon/\sqrt{\varphi^2 + 1 - \rho_\varepsilon{}^2}$

c) $Corr(v_{t+1}, \varepsilon_t) = Corr(\varepsilon_{t+1}, v_t) = \tau_{\varepsilon v} = \varphi\rho_\varepsilon/\sqrt{\varphi^2 + 1 - \rho_\varepsilon{}^2}$

In addition, v_t has a variance equal to $Var(v_t) = (\varphi^2 + 1 - \rho_\varepsilon{}^2)/(1 - \rho_\varepsilon{}^2)$

Hence, the parameters φ and ρ_ε fully pin down all correlations between the time-varying error terms, including the autocorrelation of the error term v of the second stage equation.

We also assume that c_i^1 and c_i^2 take values from two distributions with K points each (the first point is normalized to zero in both cases as in Michaud and Tatsiramos, 2008), and for each point $(k = 1, \dots, K)$, there is an associated probability p^k that is common to both c_k^1 and c_k^2. In other words, we estimate a non-parametric distribution for the two-dimensional random effect, as in Heckman and Singer (1984). The use of a non-parametric distribution for the random effects should increase the robustness of our results (Mroz, 1999).[10]

It is quite important to model the random effects separately from the noise terms for yet another reason: if one merged the random effects with the noise terms to produce a composite time-varying term, this latter term would have a component with an autocorrelation equal to one (i.e., the random effect), and this could in practice limit the range of the autocorrelation coefficients of the noise terms. Therefore, modeling separately the random effects and the noise terms makes our model more flexible.

All the above imply that the probability of observing any combination of the four possible choices (two decisions in each of the two periods in our sample) can be written[11], for a given point k of the two-dimensional distribution of the random effects, as

$$h(\boldsymbol{y}_i|\boldsymbol{X}_i, \boldsymbol{Z}_i, \boldsymbol{c}_k) = \Phi_p \begin{pmatrix} l_t\left(\boldsymbol{X}_{i,t}\boldsymbol{\beta} + c_k^1\right)/SE\left(\varepsilon_{i,t}\right), m_t\left(\boldsymbol{Z}_{i,t}\boldsymbol{\gamma} + \boldsymbol{c}_k^2\right)/SE\left(v_{i,t}\right), \\ l_{t+1}\left(\boldsymbol{X}_{i,t+1}\boldsymbol{\beta} + c_k^1\right)/SE\left(\varepsilon_{i,t+1}\right), m_{t+1}\left(\boldsymbol{Z}_{i,t+1}\boldsymbol{\gamma} + \boldsymbol{c}_k^2\right)/SE\left(v_{i,t+1}\right), \omega \end{pmatrix} \tag{A.1}$$

where $\boldsymbol{y}_i = (y_t^1, I(y_t^{1*})y_t^2, y_{t+1}^1, I(y_{t+1}^{1*})y_{t+1}^2)$, $\boldsymbol{X}_i = \left(\boldsymbol{X}_{i,t}, \boldsymbol{X}_{i,t+1}\right), \boldsymbol{Z}_i = \left(\boldsymbol{Z}_{i,t}, \boldsymbol{Z}_{i,t+1}\right)$, $l_t = \pm 1$, $l_{t+1} = \pm 1$, $m_t = \pm 1$ if $l_t = 1$ and $m_t = 0$ otherwise, $m_{t+1} = \pm 1$ if $l_{t+1} = 1$ and $m_{t+1} = 0$ otherwise, $\boldsymbol{c}_k = (c_k^1, c_k^2)$, $\omega = (l_t m_t \rho_{\varepsilon v}, l_t l_{t+1} \rho_\varepsilon, l_t m_{t+1} \tau_{\varepsilon v}, l_{t+1} m_t \tau_{\varepsilon v}, m_t m_{t+1} \rho_v, l_{t+1} m_{t+1} \rho_{\varepsilon v})$, Φ_p denotes the p-dimensional normal cumulative distribution, with $p = |l_t|+|m_t|+|l_{t+1}|+|m_{t+1}|$.

The p-dimensional normal integral in (6) is estimated by simulated maximum likelihood, using the Geweke-Hadjivassiliou-Keane simulator (Geweke, 1989; Keane, 1994). The dimension of the integral varies according to the choices observed in the first stage decisions at t and $t + 1$. It is equal to two when the person does not work in either

[10] We currently use two distribution points for each of the two random effects.
[11] We use the formulation by Jenkins et al. (2009).

period, equal to three if she works in one of the two periods, and equal to four when she works in both periods. As a result, the likelihood term for each individual is that of a multivariate probit with the number of equations ranging from two to four.

All the above imply that the log likelihood of our sample can be written as

$$lnL = \sum_{i=1}^{N}\left(log\sum_{k=1}^{K} p^k[h(\boldsymbol{y}_i|\boldsymbol{X}_i, \boldsymbol{Z}_i, \boldsymbol{c}_k]\right) \tag{A.2}$$

Equation (A.1) in turn implies that one can calculate transition probabilities of any combination of choices. As an example, the probability of transitioning from self-employment at time t to not working at time $t+1$ is given by

$$Prob(y_{t+1}^1 = 0|y_t^1 = 0, y_t^2 = 0) =$$

$$\sum_{k=1}^{K}\left(p^k \frac{\Phi_3\left(\frac{(\boldsymbol{X}_{i,t}\boldsymbol{\beta} + c_k^1)}{SE(\varepsilon_{i,t})}, \frac{(\boldsymbol{Z}_{i,t}\boldsymbol{\gamma} + \boldsymbol{c}_k^2)}{SE(v_{i,t})}, \frac{-(\boldsymbol{X}_{i,t+1}\boldsymbol{\beta} + c_k^1)}{SE(\varepsilon_{i,t+1})}, \rho_{\varepsilon v}, -\rho_{\varepsilon,} - \tau_{\varepsilon v}\right)}{\Phi_2\left(\frac{(\boldsymbol{X}_{i,t}\boldsymbol{\beta} + c_k^1)}{SE(\varepsilon_{i,t})}, \frac{(\boldsymbol{Z}_{i,t}\boldsymbol{\gamma} + \boldsymbol{c}_k^2)}{SE(v_{i,t})}, \rho_{\varepsilon v}\right)}\right) \tag{A.3}$$

i.e., by integrating over the distribution of the random effects the joint probability of working at t, being self-employed at t, and not working at $t+1$, divided by the joint probability of working and being self-employed at t.

It is worth noting that the term multiplied by p^k in (5) is defined for any given values of the two random effects $c^1$and c^2, i.e., the fact that we can use joint probabilities to calculate transition probabilities is due solely to the existence of ρ_ε. If ρ_ε were equal to zero, the conditional probability in (A.3) would collapse to the marginal probability of the outcome at $t+1$ for all values of the random effects. This would be so because in the case of ρ_ε equal to zero the numerator would be equal to the probability of not working at t+1 multiplied by the probability of being self-employed at t. On the other hand, if φ

were equal to zero but ρ_ε different from zero, the conditional probability in (8) would still be different from the marginal probability of the outcome at $t+1$. In other words, selectivity is not necessary for the existence of non-trivial transition probabilities, although its presence obviously affects their value.

Let us also emphasize that conditional probabilities like the one shown in (A.3) do not require an outcome defined as a transition but are derived naturally from the combinations of the static outcomes while taking into account all possible sources of correlation in the noise terms.

Our estimation model can be readily extended to incorporate unobserved heterogeneity that is correlated with the observables by using the Mundlak – Chamberlain formulation (Mundlak, 1978; Chamberlain, 1980, 1984), which is just a series of the means of the time-varying variables that is added to the existing linear indices $\boldsymbol{X}_{i,t}\beta$ and $\boldsymbol{Z}_{i,t}\gamma$. In our context, however, the inclusion of a Mundlak – Chamberlain term is problematic because we have only two periods and thus the term is likely to be very collinear with the forcing variables.

While our setup has many advantages, it also suffers from a couple of disadvantages: i) the likelihood shown in (A.2) is more complicated than that of a simple multinomial logit; ii) our first stage equation for working or not does not distinguish between the different reasons for not having a job (retirement, unemployment, not in the labor force but not retired). The reason for this simplification is that a richer first-stage model would require a multinomial probit, which empirically needs alternative-specific variables in order to be identified (Keane, 1992). Such variables are very hard to find, and we can't readily think of any that are present in our sample. Otherwise, a multinomial probit can in principle be incorporated in the multivariate normal framework shown in (3), albeit at the cost of increasing the dimension of the integral compared to using a simple probit to model the decision to work or not. This would make the convergence of an already very complicated likelihood function even more difficult.

A.2 Calculation of magnitudes of Interest via Monte Carlo simulation

The magnitudes $\varphi, \rho_\varepsilon$ and $\boldsymbol{p} = (p_1, \dots, p_K)$ must all satisfy constraints: ϕ and ρ_ε must lie between minus one and one and $p_1, \dots, p_K$ must be between zero and one. These constraints make convergence of our already complicated likelihood function even more difficult. Therefore we estimate $\varphi, \rho_\varepsilon$ and $\boldsymbol{p}$ as functions of the unconstrained parameters μ, ψ, and $\boldsymbol{\omega} = (\omega_2, \dots, \omega_K)$, that thus become the ones with respect to which the likelihood function is maximized. The mapping between the new parameters and $\varphi, \rho_\varepsilon$ and $\boldsymbol{p}$ is as follows:

$$\varphi = \frac{e^\mu - 1}{e^\mu + 1}, \rho_\varepsilon = \frac{e^\psi - 1}{e^\psi + 1}, p_k = \frac{e^{\omega_k}}{\sum_{k=1}^{K} e^{\omega_k}} \tag{A.4}$$

with $\omega_1 = 0$, $k = 1, \dots, K$. Given that marginal effects, $\varphi, \rho_\varepsilon$ and $\boldsymbol{p}$ all represent magnitudes that are nonlinear functions of the estimated parameters $\hat{\alpha}^* = (\widehat{\boldsymbol{\beta}}, \widehat{\boldsymbol{\gamma}}, \hat{\mu}, \hat{\psi}, \hat{\boldsymbol{c}}_2, \dots, \hat{\boldsymbol{c}}_K, \widehat{\omega}_2, \dots, \widehat{\omega}_K)$, we compute their point estimates and standard errors via Monte Carlo simulation (Train, 2003), that is by using the formula

$$E\big(g(\alpha)\big) = \int g(\alpha) f(\alpha) d\alpha \tag{A.5}$$

where $g(\alpha)$ denotes the magnitude of interest and $f(a)$ the joint distribution of all the elements in α. We implement this simulation estimator by drawing 1,000 times from the joint distribution of the vector of parameters $\hat{\alpha}^*$ under the assumption that it is asymptotically normal with mean and variance-covariance matrix equal to the maximum likelihood estimates. For a given parameter draw j we generate the magnitude of interest $g(\hat{\alpha}^{*j})$. For marginal effects in particular, we first calculate the partial effect corresponding to each individual in our sample and then calculate the marginal effect $g(\hat{\alpha}^{*j})$ as the weighted average (using sample weights) of the effect across individuals.[12] We then estimate $E(g(\alpha))$ and its standard error as the mean and standard deviation respectively of the distribution of $g(\hat{\alpha}^{*j})$ over all parameter draws.

[12] We do not evaluate marginal effects at sample means since this practice can lead to severely misleading results (see Train, 2003, pp. 33-34).

Figure 1. Self-employment rates across gender and age

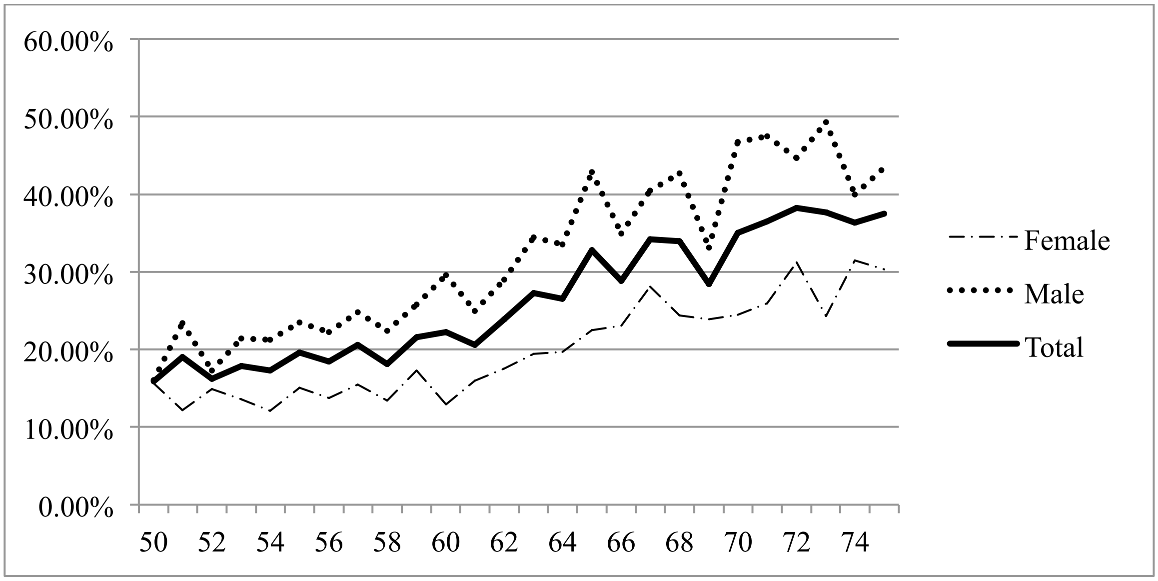

Table 1. Descriptive statistics

Variable	Statistic
Is working for pay	45%
Self-employed (conditional on working)	22%
Age	62.3
50-54	17%
55-59	25%
60-64	20%
65-69	18%
70-75	15%
Female	53%
Is in a couple	72%
No of children	2.56
No of grandchildren	3.31
Less than high school	30%
High School Education	33%
Post-secondary education	36%
Self-reported health fair or worse	28%
Is Depressed	26%
Immediate recall score	5.43
No of observations	67,108

Table 2. Occupational status by country and by gender

Country	Working			Self-employed (conditional on working)		
	Total	**Male**	**Female**	**Total**	**Male**	**Female**
USA	54.04%	60.55%	48.30%	21.50%	26.34%	16.16%
Sweden	55.63%	58.20%	53.00%	13.57%	19.04%	7.39%
Denmark	51.64%	57.65%	45.39%	10.80%	13.61%	7.08%
Germany	36.13%	39.11%	33.33%	17.37%	18.48%	16.15%
Netherlands	39.43%	46.99%	32.19%	14.89%	14.40%	15.59%
Belgium	30.22%	36.53%	23.99%	19.79%	21.75%	16.84%
France	36.56%	38.64%	34.72%	15.53%	18.03%	13.06%
Switzerland	59.06%	68.21%	50.25%	26.66%	31.25%	20.66%
Austria	27.91%	35.07%	21.21%	17.22%	16.52%	18.31%
Italy	25.21%	36.06%	15.72%	36.29%	45.20%	18.42%
Spain	31.04%	40.11%	23.11%	28.03%	28.81%	26.86%
Greece	31.74%	45.59%	19.31%	44.23%	49.11%	33.89%
England	36.66%	42.55%	31.27%	18.00%	22.58%	12.31%

Table 3. Self-employment transitions by gender, all countries

Transitions	All	Female	Male
Self employment to self employment	70.68%	63.87%	74.57%
Self employment to salaried work	8.42%	8.71%	8.25%
Salaried work to self employment	2.31%	2.14%	2.48%
Not working to self employment	1.61%	1.49%	1.78%
Number of observations	30,105	16,930	13,175

Note: Numbers denote individuals observed in a given occupation the second wave in our data as a percentage of individuals observed in a given occupation in the first wave.

Table 4. Self-employment transitions by country

Transitions	US	EN	SE	DK	DE	NL	BE
Self employment to self employment	73.6%	72.0%	57.8%	65.7%	62.9%	72.4%	79.1%
Self employment to salaried work	8.8%	10.9%	15.8%	16.4%	9.8%	7.0%	5.1%
Self employment to not working	17.6%	17.2%	26.4%	17.9%	27.2%	20.7%	15.8%
Salaried work to self employment	2.4%	2.3%	3.9%	1.1%	2.8%	1.8%	2.0%
Not working to self employment	2.5%	0.7%	1.4%	0.7%	1.2%	2.1%	0.9%
Number of observations	10,829	4,528	1,568	969	1,287	1,448	2,198

Transititions	FR	CH	AT	IT	ES	GR
Self employment to self employment	81.5%	68.4%	70.5%	64.3%	58.6%	75.3%
Self employment to salaried work	5.4%	11.7%	0.0%	5.7%	12.1%	2.6%
Self employment to not working	13.2%	19.9%	29.5%	30.0%	29.2%	22.1%
Salaried work to self employment	1.4%	2.2%	0.0%	1.6%	3.7%	1.4%
Not working to self employment	0.9%	4.7%	0.2%	0.6%	1.0%	0.9%
Number of observations	1,476	552	894	1,472	1,021	1,863

Note: Numbers denote individuals observed in a given occupation the second wave in our data as a percentage of individuals observed in a given occupation in the first wave.

Table 5. Correlations between occupational status and labor market policies

Labor market policies	Working	Self-employed (conditional on working)
Rule of Law	0.60	-0.80
EPL	-0.49	0.23
Incentives for employment, % of GDP	0.04	-0.12
Full Unemployment Benefits, % of GDP	-0.05	-0.43
Incentives for early retirement, % of GDP	-0.13	-0.29

Table 6. Marginal effects – Static probabilities, whole sample

Variable	Probability of working (unconditional)			Probability of self-employment (conditional on working)		
	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value
Female	-0.0893	0.0051	0.0000	-0.1110	0.0089	0.0000
In a couple	0.0016	0.0057	0.7811	-0.0005	0.0102	0.9585
Health fair or worse	-0.1323	0.0053	0.0000	0.0087	0.0069	0.2076
Is depressed	-0.0289	0.0048	0.0000	0.0113	0.0051	0.0282
Age 55-59	-0.0949	0.0068	0.0000	0.0222	0.0072	0.0020
Age 60-64	-0.3636	0.0131	0.0000	0.0876	0.0114	0.0000
Age 65-69	-0.6279	0.0146	0.0000	0.1854	0.0136	0.0000
Age 70-75	-0.7651	0.0106	0.0000	0.2435	0.0176	0.0000
High-school Education	0.0870	0.0067	0.0000	-0.0340	0.0119	0.0042
Some post-secondary education	0.1616	0.0078	0.0000	-0.0110	0.0112	0.3238
Number of children	0.0198	0.0031	0.0000	0.0014	0.0043	0.7545
Number of grandchildren	-0.0287	0.0034	0.0000	0.0069	0.0049	0.1578
Score in immediate recall test	0.0179	0.0019	0.0000	-0.0041	0.0027	0.1278
Index of rule of law	0.0188	0.0031	0.0000	-0.0559	0.0053	0.0000
Employment protection legislation index	-0.0502	0.0060	0.0000	0.0223	0.0081	0.0058
Expenditure on employment incentives (% of GDP)	0.0365	0.0031	0.0000	-0.0071	0.0046	0.1191
Expenditure on full unemployment benefits (% of GDP)	0.0038	0.0040	0.3353	-0.0172	0.0063	0.0061
Expenditures on Incentives for early retirement (% of GDP)	-0.0265	0.0020	0.0000	0.0008	0.0035	0.8235

Table 7. Type I marginal effects – transition probabilities, whole sample

Variable	Probability of not working at period *t+1* conditional on working at period *t*			Probability of being self-employed at period *t+1* conditional on not working at period *t*			Probability of being self-employed at period *t+1* conditional on being a salaried worker at period *t*			Probability of being self-employed at period *t+1* conditional on being self-employed at period *t*			Probability of not working at period *t+1* conditional on being self-employed at period *t*		
	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value
Female	-0.0036	0.0004	0.0000	-0.0259	0.0034	0.0000	-0.1137	0.0725	0.1169	-0.1073	0.0148	0.0000	-0.0105	0.0090	0.2457
In a couple	0.0001	0.0002	0.7679	-0.0001	0.0020	0.9646	-0.0005	0.0374	0.9899	-0.0004	0.0094	0.9633	0.0001	0.0005	0.7977
Health fair or worse	-0.0075	0.0007	0.0000	-0.0032	0.0016	0.0437	0.0160	0.0249	0.5198	-0.0047	0.0078	0.5523	-0.0089	0.0042	0.0327
Is depressed	-0.0012	0.0002	0.0000	0.0012	0.0010	0.2575	0.4532	4.3625	0.9173	0.0085	0.0049	0.0805	-0.0019	0.0009	0.0368
Age 55-59	0.0094	0.0017	0.0000	0.0324	0.0029	0.0000	0.0189	0.0068	0.0055	0.0160	0.0071	0.0245	0.0076	0.0036	0.0355
Age 60-64	-0.0114	0.0027	0.0000	0.0822	0.0055	0.0000	0.0879	0.0165	0.0000	0.0572	0.0149	0.0001	-0.0092	0.0129	0.4755
Age 65-69	-0.0491	0.0017	0.0000	0.0638	0.0051	0.0000	0.1992	0.0446	0.0000	0.1114	0.0306	0.0003	-0.0400	0.0112	0.0003
Age 70-75	-0.0602	0.0022	0.0000	0.0059	0.0049	0.2300	0.2850	0.0885	0.0013	0.1322	0.0521	0.0112	-0.0394	0.0086	0.0000
High-school Education	0.0063	0.0007	0.0000	-0.0042	0.0026	0.0995	-0.0410	0.0207	0.0475	-0.0239	0.0117	0.0416	0.0091	0.0034	0.0068
Some post-secondary education	0.0072	0.0009	0.0000	0.0029	0.0026	0.2677	-0.0170	0.0201	0.3978	0.0036	0.0112	0.7493	0.0073	0.0038	0.0555
Number of children	0.0007	0.0001	0.0000	0.0010	0.0008	0.2446	-0.0126	0.0659	0.8487	0.0026	0.0041	0.5184	0.0011	0.0007	0.0978
Number of grandchildren	-0.0014	0.0002	0.0000	0.0003	0.0010	0.7826	0.0163	0.0230	0.4771	0.0043	0.0048	0.3655	-0.0020	0.0009	0.0235
Score in immediate recall test	0.0006	0.0001	0.0000	-0.0001	0.0005	0.7866	-0.0181	0.0655	0.7823	-0.0026	0.0026	0.3139	0.0010	0.0005	0.0482
Index of rule of law	0.0006	0.0001	0.0000	-0.0100	0.0014	0.0000	-0.0694	0.0661	0.2936	-0.0492	0.0070	0.0000	0.0016	0.0011	0.1318
Employment protection legislation index	-0.0027	0.0005	0.0000	0.0025	0.0016	0.1182	0.0317	0.0330	0.3362	0.0171	0.0080	0.0315	-0.0040	0.0017	0.0195
Expenditure on employment incentives (% of GDP)	0.0011	0.0001	0.0000	-0.0001	0.0009	0.9514	-0.0211	0.0661	0.7494	-0.0041	0.0044	0.3461	0.0020	0.0011	0.0793
Expenditure on full unemployment benefits (% of GDP)	0.0001	0.0002	0.3396	-0.0032	0.0012	0.0108	-0.0310	0.0665	0.6408	-0.0157	0.0059	0.0081	0.0003	0.0004	0.4867
Expenditures on Incentives for early retirement (% of GDP)	-0.0012	0.0001	0.0000	-0.0009	0.0007	0.2236	0.0094	0.0162	0.5608	-0.0013	0.0033	0.7069	-0.0018	0.0009	0.0331

Table 8. Type II marginal effects – transition probabilities, whole sample

Variable	Probability of not working at period *t+1* conditional on working at period *t*			Probability of being self-employed at period *t+1* conditional on not working at period *t*			Probability of being self-employed at period *t+1* conditional on being a salaried worker at period *t*			Probability of being self-employed at period *t+1* conditional on being self-employed at period *t*			Probability of not working at period *t+1* conditional on being self-employed at period *t*		
	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value	Marg. Eff.	Std. Error	P-value
In a couple	-0.0011	0.0042	0.7988	0.0009	0.0041	0.8164	-0.0002	0.0101	0.9841	-0.0002	0.0094	0.9835	-0.0013	0.0050	0.7957
Health fair or worse	0.1582	0.0112	0.0000	-0.0576	0.0039	0.0000	-0.0476	0.0203	0.0190	-0.0545	0.0124	0.0000	0.1727	0.0138	0.0000
Is depressed	0.0249	0.0047	0.0000	-0.0157	0.0028	0.0000	0.0032	0.0052	0.5436	0.0011	0.0051	0.8322	0.0286	0.0053	0.0000
Number of grandchildren	0.0246	0.0035	0.0000	-0.0163	0.0022	0.0000	-0.0011	0.0051	0.8236	-0.0029	0.0051	0.5721	0.0285	0.0042	0.0000
Score in immediate recall test	-0.0126	0.0015	0.0000	0.0113	0.0015	0.0000	-0.0003	0.0029	0.9249	0.0006	0.0027	0.8191	-0.0146	0.0018	0.0000
Index of rule of law	-0.0131	0.0019	0.0000	0.0002	0.0023	0.9438	-0.0527	0.0078	0.0000	-0.0480	0.0060	0.0000	-0.0152	0.0024	0.0000
Employment protection legislation index	0.0471	0.0073	0.0000	-0.0257	0.0031	0.0000	0.0060	0.0103	0.5606	0.0020	0.0085	0.8157	0.0543	0.0084	0.0000
Expenditure on employment incentives (% of GDP)	-0.0236	0.0022	0.0000	0.0242	0.0025	0.0000	-0.0001	0.0049	0.9842	0.0016	0.0045	0.7234	-0.0275	0.0028	0.0000
Expenditure on full unemployment benefits (% of GDP)	-0.0028	0.0029	0.3375	-0.0009	0.0028	0.7415	-0.0166	0.0071	0.0191	-0.0150	0.0060	0.0126	-0.0033	0.0035	0.3410
Expenditures on Incentives for early retirement (% of GDP)	0.0225	0.0021	0.0000	-0.0159	0.0014	0.0000	-0.0064	0.0036	0.0738	-0.0076	0.0034	0.0249	0.0260	0.0028	0.0000

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