Labor Market Dynamics in Romania and the Social Safety Net*

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Abstract

In this paper, we estimate a model of labor market dynamics for Romania using a three years panel of individuals from 1994 to 1996. This period was marked by the continued slow pace of economic liberalization and transformation that began in 1990. Our model of labor market transitions examines changing movements in and out in and out of employment, unemployment and self-employment, and incorporates specific features of the Romanian labor market, such as the social safety net. We take into account demographic characteristics, state dependence and individual unobserved heterogeneity by modeling the employment transitions with a dynamic mixed multinomial logit.

THEME : Labour markets in transition economies

KEY WORDS: Labor dynamics; transition; Romania; mixed multinomial logit.

JEL-Code: P2, P3

*PRELIMINARY. DO NOT QUOTE. For copies of the questionnaire, interviewer manual and information on how to obtain copies of the data sets used in this paper, please see: *http://www.worldbank.org/lsms/country/romania/rm94docs.html*

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1 Introduction

Since the end of the 1980s Eastern Europe and the former Soviet Union have been experiencing a fundamental restructuring of their economic system toward a market economy. In Romania, prior to the current reform period, wages as well as the allocation of labor were heavily regulated[1]. It is only in 1991 that, within a broad based reform package, the government began to liberalize the labor market by allowing wage scales, hiring and promotion criteria to be determined by collective contracts between workers and managers that are renewed annually. Still Romania's economic transition from a state-controlled to a market-oriented economy has been slow, characterized by a lack of commitment to reform and weak economic performance (Organisation for Economic Cooperation and Development (OECD) (2000)). Much has been said of the impact of the economic reform on poverty, macroeconomic imbalances and firm's productivity, but much less is known about the impact of transition on labor markets at a micro level.

The study of employment dynamics in transition economies has been relatively limited, and has long been hindered by the lack of suitable data sets. This is unfortunate because the study of individual labor force histories can provide important insights on the effect of privatization and restructuring on the labor market. By measuring the effects of demographic characteristics, labor market conditions, and active labor market policies on individuals' labor market history, one can identify imbalances across socio-economic groups.

Svejnar (1999) surveys the principal applied labor market studies in the Central and Eastern European Countries as they launched the transition from central planning to a market economy. Most early work on labor market dynamics focused on the determinants of unemployment and in particular on the

[1] See Paternostro and Sahn (1998).

effects of demographic characteristics and labor market policies on unemployment duration and the probability of finding a job (for example Ham, Svejnar, and Terrell (1998) on the Slovak and Czech Republics[2], Bellmann, Estrin, and Lehmann (1995) on East Germany, Micklewright and Nagy (1999) on Hungary, and Jones and Kato (1997) on Bulgaria).

In this paper, we take a broader view of the labor market and study transitions across four labor market categories: employed, unemployed (distinguishing between those receiving and not receiving public transfers) and self-employed. This broader perspective is important for several reasons. For example, transitions in and out of self-employment are usually found to be important in transition economies. Earle and Sakova (2000) document the rising importance of self-employment in total employment for six transition economies and Wu (2002) also finds that rates of entry into self-employment increased in China concurrent with market liberalization. Moreover, the broader perspective allows us to identify ways in which the social safety net or public transfers interact with, and affect employment status. This issue is particularly important since Romania, like most countries in Eastern Europe, has a generous package of social insurance and social assistance[3] that is likely to have an impact on labor market transitions. For example, Micklewright and Nagy (1999) in Hungary find that the "most likely way to exit unemployment insurance is not by getting a job but by exhausting entitlement to benefit."

Studies of labor market dynamics usually use one of two methods. Duration models can be used if one knows how much time individuals spend in the labor market state of interest. Since we have no such information, we model transition probabilities between different labor market states with a discrete choice model.

[2]See also Ham, Svejnar, and Terrell (1999), Terrell and Storm (1999), Lubyova and van Ours (1997) for other works on those countries.

[3]Romania also has a rather large set of state transfers as discussed by Sahn and Younger (2000) and Sahn and Gerstle (2001).

The particular model we use in this paper allows us to take into account both state dependence and individual unobserved heterogeneity through the inclusion of past labor market states as explanatory variables and individual specific random effects, two characteristics that are deemed to be important in the study of labor market dynamics. In fact, use of the multinomial logit permits us to allow for correlation between different labor market states both across time and at the individual level.

We use three successive years of panel data from a household survey that was conducted in Romania from 1994 to 1996. It is not typical to study labor market dynamics with a household survey. However, the Romania Integrated Household Survey contains detailed data about labor market activities and various forms of social security, in addition to insure standard questions in jointly determined household production and consumption activities. It should be interesting to compare our results to those obtained with more traditional labor force surveys[4].

The plan of the paper is as follows. We first provide a brief description of the data and non-parametric estimation of labor market dynamics with transition matrices. We follow with a description of the statistical model employed. We then discuss the results and conclude.

2 Labor Market Transitions

2.1 Data

For decades under totalitarian rule, the National Commission of Statistics conducted a family budget survey. It was not representative of the population, both because the original sample frame was enterprise-based, not household-based,

[4]See Voicu (2002) for a paper focusing also on Romania. Voicu (2002) uses a multivariate probit model with the Romanian Labor Force Survey. He focuses on two states, employment and non-employment. He finds, among other things, that personal characteristics have a strong influence on employment decisions and that sequential employment decisions exhibit a strong but declining persistence.

and because there was no serious attempt to update the permanent sample of households included from one year to the next. In the early 1990s, the Romanian Integrated Household Survey (RIHS) was designed by the National Commission of Statistics to respond to the deficiencies in the sampling and questionnaire design of the Family Budget Survey. Field testing took place in early 1994, and the survey officially went into the field in April 1994. The survey was thereafter repeated from 1995 through 1997. Each year's sample is nationally and regionally representative[5].

The RIHS is thus is the first large-scale nationally representative household survey ever administrated in the country, and takes place during Romania's transition to a market economy. The investigation was first conducted from a household sample of 24,560 households randomly selected from all districts of Romania and the city of Bucharest. The survey collected detailed information on household incomes and expenditures, labor market activity, public transfers and a wide range of living standard indicators. The yearly Romanian household surveys included a small rotating panel of households that remained in the survey from one year to the next. By matching individuals within households that were present for two consecutive years, we were able to construct panels containing labor market information for 6168 individuals for 1994-1995 and 6918 individuals for 1995-1996.

In order to analyze employment transitions, we restrict our sample to individuals between the age of 15 and 65 who were in the labor force. We divide those individuals into three mutually exclusive labor market states: employee, unemployed and self-employed. Note that we thus exclude pensioners. Labor market states frequencies for individuals present in 1994-1995 are shown in Table 1 and then for the present in 1995-1996 in Table 2.

It is interesting to note that in each year, the employee category comprises

[5]The survey was continued after 1997, but without the Labor Market module.

just over two-third of the potential labor force. The self-employed comprise 21 percent of the working age population, and that proportion tends to rise for more recent years. This rise in self-employment is mirrored by a decrease in unemployment. This seems to highlight a role for self-employment as a way to escape unemployment. However, to know if the increase in self-employment is due to people moving from unemployment or dropping out of employment, we have to look at transition tables. Those transitions tables are presented in the next section.

2.2 Nonparametric Analysis

Trends in labor market status can be analyzed in the context of a simple four-states Markov chain model linking labor market status in different years. To get a better picture of how the unemployed are faring and how government interventions through the provision of benefits affects labor market dynamics, we have split the unemployed into two subcategories, distinguishing between those that do, and do not receive benefits. The estimates in Table 3 are average observed transition frequencies.

Focusing first on the role of self-employment as a potential buffer for people coming out of employment, we first note that employment seems to be relatively stable on a year-to-year basis with about 94% of the people being able to keep their job. Among the individuals losing their job, approximately half entered unemployment (3.0%) and the other half self-employment (2.8%). This could be construed as suggesting that self-employment is not a resting or interim stop. But remember that the overall share of jobs in self-employment is only about one-third of those who are employed. So a nearly equal split in destination highlights the buffering role of self-employment.

Fifty percent of the unemployed receiving benefits are no longer unemployed

one year later. Again, employment and self-employment are nearly as likely to be paths out of unemployment. This result applies to the unemployed with and without benefits. Our initial expectations were that after benefits dry up, people would become more desperate and stop queuing for rationed jobs and instead enter self-employment at a higher rate than those still receiving benefits. The results do not support this expectation, possibly reflecting that even the more formal sectors of the labor market are more resilient than we initially thought. Therefore, even if self-employment is a common exit out of unemployment, it does not appear to play a crucial role as a springboard toward employment.

Focusing next on the impact of the social safety net on labor market dynamics, we note that about one-third of the people who depart from employment do not receive benefits in the year following job loss. Those people are not caught by the social safety net. Moreover, we see also 16% of the unemployed with benefits exhaust their benefits without being able to find a regular job or get into self-employment. Thus, many people are initially caught by the safety net, but then exhaust their benefits before finding a job or re-entering the labor market. The numbers also indicate that transition rates out of unemployment into self-employment are not markedly different for people receiving benefits or not, a somewhat surprising result. A slightly higher share of those unemployed without benefits enter the labor market. We also make a distinction (not shown in the Tables) between whether the unemployed were looking for a job or not. We observed, to no surprise, that individuals looking for a job end up being 'Employed' at a much higher frequency than 'Unemployed not looking for a job'. Individuals not looking for a job tend to end up being 'Self-Employed'.

Table 4 presents summary statistics for our sample divided by labor market status. We note that approximately 60% of those classified as employed are male, while the converse is true for the self-employed, where women pre-

dominate by approximately the same share. Individuals who are employed or self-employed are older than the unemployed. This implies that unemployment tends to disproportionately afflict the young. As for education, we note that the self-employed have on average less than eight years of schooling, in contrast with the other categories where the mean schooling ranges from 10.1 years for the unemployed with benefits to 11.5 years for the employed. It is also noteworthy that while 12 percent of the employed have higher education degrees, this is the case for less than one percent of the persons in the three other categories. In contrast, nearly 30 percent of the self-employed have less than a high school education, while this is the case for only three percent of the employed, six percent of the unemployed with benefits, and nine percent of the unemployed without benefits. Also, not surprisingly, we notice that the share or urban residents among those employed is greater than the other categories. Quite interestingly, if we look at the share of unemployed and unemployed without benefits by region, we find a higher share of the former in urban areas. While the descriptive findings are of interest, we next estimates the labor market dynamics using a discrete choice model to test for the robustness of the non-parametric analysis.

3 Statistical Model

Transition matrices give a complete picture of movements across different labor market status. While it is possible to decompose those matrices along variables of interest, this would be of limited use if we didn't control for other factors that affect those transition probabilities. A preferred option, which we employ in this paper, is to use a reduced-form multinomial choice model explaining the labor market state of each individual during each time period. In this way, we have a complete decomposition of the transition probabilities along covariates of interest like age, education, family composition and region of residence.

We define the utility of individual i for being in labor market state j at time t as

$$\tilde{y}_{ijt} = X_{it}\beta_j + \sum_{l=1}^{J} \gamma_l d^y_{i(t-1)l} + \epsilon_{ijt}, \quad i = 1, ..., N, \quad j = 1, ..., J \tag{1}$$

where J is the number of possible market states, X_{it} is a vector of explanatory variables for individual i at time t, and $d^y_{i(t-1)l}$, $l = 1, ..., J$, are a set of dummy variables equal to 1 if $y_{i(t-1)} = l$. We assume $\epsilon_{i1t}, ..., \epsilon_{iJt}$ are distributed type 1 extreme value so that the usual multinomial logit model results. For model identification, we assume $\beta_1 = 0$ and $\gamma_1 = 0$, i.e. employment is taken to be the base category for both past and present labor market states.

The log-likelihood of the multinomial logit model is written

$$L = \sum_{i=1}^{N} L_i \tag{2}$$

with

$$L_i = \sum_{t=1}^{2} \sum_{j \in C_i} d_{ij} \ln \Pr[y_{it} = j] \tag{3}$$

where

$$d_{ij} = \begin{cases} 1 & \text{if individual } i \text{ choose an alternative } j \\ 0 & \text{otherwise} \end{cases} \tag{4}$$

The inclusion of past labor market states is done in order to take into account the individual's labor market history. It is well known that it is more likely that an individual will be employed if he was employed in the last period, a phenomenon known as state dependence. Theoretically, we would like to model

$$P[y_{it} = j] = P[y_{it} = j | y_{it-1}, y_{it-2}, y_{it-3}, ...] \tag{5}$$

but in what follows, we will assume

$$P[y_{it} = j] = P[y_{it} = j | y_{it-1} = k] \tag{6}$$

The implicit assumption is that transition probabilities follow a Markov process of order 1. Note also that the previous's period explanatory variables have an impact on y_{it} through their effect on y_{it-1}.

We can also make use of the panel structure of our data set by adding a random effect to the utility functions defined above. This allows us to take into account unobserved individual heterogeneity in labor market status. More specifically, we have

$$\epsilon_{ijt} = u_{ij} + v_{ijt}, \quad i = 1, ..., N, \quad j = 1, ..., J \tag{7}$$

where u_{ij} are the individual-choice specific random effects. We assume the u_{ij} are normally distributed with mean zero and covariance matrix Ω. Since the u_{ij} are not given, the (unconditional) choice probabilities are obtained by integrating (7) all values of u_{ij} weighted by the density of u_{ij}:

$$L_i() = \int L_i(u) f(u) du \tag{8}$$

We estimate this slightly more complicated form by maximizing the marginal likelihood, integrating out the heterogeneity components, assuming joint normality. Where a closed form solution to the integral does not exist, the likelihood may be computed by approximating the normal integral by a weighted sum over "conditional likelihoods", i.e. likelihoods conditional on certain well-chosen values of the residual. We use Gauss-Hermite Quadrature to approximate normal integrals (e.g., Abramowitz and Stegun (1972), pp. 890 and 924).

For the first year of our panel, we don't know the previous state. Moreover, it would be wrong to assume those initial states to be exogenous. This is the usual problem of initial conditions. The problem of initial conditions can be viewed as a problem of endogeneity of the lagged values of the labor market status in equation (1). To solve this problem, we also estimate simultaneously a multinomial logit on the initial states where we specify the latent utility as:

$$\tilde{y}_{ijt} = X_{it}\beta_j + \epsilon_{ijt}, \quad i = 1, ..., N, \quad j = 1, ..., J \tag{9}$$

Note that this is the same as equation (1) except it is obviously impossible to include lagged values for occupations. We also decompose the error term to include an individual specific effect in the same way as in equation (7). We maximize the full likelihood where we assume that every labor market status and intial states are independent conditional on a vector of heterogeneity terms u_{ij}.[6]

4 Results[INCOMPLETE]

We present results where the base category is the employed. Positive coefficients in the covariates are associated with decreased likelihood of being employed. In addition, by comparing coefficients across categories, it is possible to draw inference on the impact of the explanatory variables on the probability of being in a specific labor market state, relative to the other. We also report marginal effects for the dynamic mixed three-states model in Table 8. The marginal effects were computed using ..

[6]The vector of heterogeneity terms has four dimensions in our base model and 6 dimensions when we distinguish between unemployed with or without benefits. To reduce the dimension of the problem, we assume that every individual had one draw u_i from the distribution of heterogeneity components and that

$$u_{ij} = \lambda_j u_i$$

with one element of the vectors of λ normalized to one.

4.1 Determinants of self-employment

Our results first and foremost underscore the importance of taking into account individual unobserved heterogeneity and state dependence when estimating labor market transition probabilities. Focusing first in the 3-status model in Columns 1 & 2, we find statistically significant effects for lagged labor market status. Once we control for observable and unobservable characteristics, we find it much more likely to see people moving from unemployment to self-employment than the reverse. Those in self-employment are more likely to remain at that state than the unemployed. Among the unemployed and self-employed, they are both more likely to move into the other state than into the employed category.

Education is also an important factor in explaining transitions. Individuals with less education are more likely to be unemployed or self-employed. Comparing between unemployment and self-employment, we find that more educated individuals are more likely to be self-employed than unemployed, controlling for other covariates. The negative coefficients on higher education, although not statistically significant, suggest that these individuals are more likely employed than in the other two states, and the effect is particularly strong relative to self-employment. Having a professional or high school degree increases the likelihood of being employed relative to self-employed, although does not raise the probability of employment relative to unemployment

We find an asymmetrical impact of marriage. Married people are less likely to be unemployed than employed but more likely to be self-employed than employed. Not surprisingly, we also find that it is much more difficult to find self-employment in urban areas. Finally, we find no impact of household size.

We also find an interesting gender story, especially when examining the interaction between age and gender. Specifically, males are more likely to be employed, realtive to unemployed, and just the opposite occurs in the case

of self-employment which has a positive and significant gender dummy. This positive effect of being male on the probability of being employed relative to unemployed decreases with age. Conversely, the decreased probability of being employed relative to self-employment for males is less for older workers. Notice that correlations between both error and individual specific terms are statistically significant, thus allowing us to reject the independence of irrelevant alternatives hypothesis. Quite interestingly, both correlations are negative. This indicates that individuals in self-employment differ in some unobservable way from individuals in unemployment. This diminishes the role of self-employment as a buffer between employment and unemployment. The negative correlation between the individual-time specific components indicates that idiosyncratic shocks move unemployment and self-employment into opposite directions.

Turning to the marginal effects[ADD DISCUSSION OF THE MARGINAL EFFECTS]

4.2 Impacts of the safety net

In the last three columns of table 6 we distinguish between unemployed with and without benefits. Results for self-employment are very similar to those above, so we focus on the different determinants of unemployment with or without benefits. We find some striking results.

Although we didn't find important effects for age and gender in distinguishing the unemployed from the self-employed, both play an important role in explaining the probability of receiving benefits if unemployed. In fact, we find that being male and being younger increases the probability of not receiving benefits if unemployed.

Education continues to play an important role. Having more education increases the likelihood of receiving benefits if unemployed. We find an opposite,

and nearly equal magnitude on the statistically significant urban dummy variable for the model of those receiving and not receiving benefits. The results imply that individuals living in urban areas are much more likely to receive benefits than rural residence. Also worrying is the fact that state dependence is stronger for unemployed receiving benefits (2.46 versus 2.02).

In summary, making this further distinction between whether the unemployed receive benefits or not allows us to single out a category of people not caught by the safety net, namely young males living in urban areas.

5 Conclusion

In this paper we evaluated how employment transitions interact with the social safety net in Romania, particularly unemployment insurance. We used a three years individual panel from 1994 to 1996 in the post-transition period. We first compute transition matrices that give a complete picture of the mobility process between different labor market states.

Further along, we are able to take into account demographic characteristics, state dependence and individual unobserved heterogeneity by modelling the employment transitions with a dynamic mixed multinomial logit. We find that a large portion of the unemployed are not receiving benefits. Those not receiving benefits are more likely to be younger male living in urban areas. However, this does not seem to have a big impact on their probability of transiting out of unemployment although state dependence is stronger for unemployed not receiving benefits.

We find some evidence that self-employment act as a buffer zone between employment and other labor market status. Comparing between unemployment and self-employment, we find education to be an important factor in predicting in which category an individual will be. However, our estimation of the

variance-covariance structure between unemployment and self-employment indicates that individuals going into self-employment differ in some unobservable way compared to individuals going into unemployment.

References

Abramowitz, M. and I. Stegun (1972). *Handbook of Mathematical Functions*. Dover Publications, Inc., New-York.

Bellmann, L., S. Estrin, and H. Lehmann (1995). The Eastern German labor market in transition: Gross flow estimates from panel data. *Journal of Comparative Economics 20*, 139–170.

Earle, J. S. and Z. Sakova (2000). Business start-ups or disguised unemployment? Evidence on the character of self-employment from transition economies. *Labour Economics 7*, 575–601.

Ham, J. C., J. Svejnar, and K. Terrell (1998). Unemployment and the social safety net during transitions to a market economy: Evidence from the Czech and Slovak republics. *American Economic Review 88*(5), 1117–1142.

Ham, J. C., J. Svejnar, and K. Terrell (1999). Women's unemployment during transition. evidence from Czech and Slovak micro-data. *Economics of Transition 7*(1), 47–78.

Jones, D. C. and T. Kato (1997). The nature and determinants of labor market transitions in former communist economies: Evidence from Bulgaria. *Industrial Relations 36*(2), 229–254.

Lubyova, M. and J. van Ours (1997). Unemployment dynamics and the restructuring of the Slovak unemployment benefit system. *European Economic Review 41*, 925–934.

Micklewright, J. and G. Nagy (1999). Living standards and incentives in transition: The implications of UI exhaustion in Hungary. *Journal of Public Economics 73*, 297–319.

Organisation for Economic Cooperation and Development (OECD) (2000). *Labour Market and Social Policies in Romania*. Paris: OECD.

Paternostro, S. and D. E. Sahn (1998). Wage determination and gender discrimination in a transition economy: The case of Romania. *Working Paper #93, Cornell Food and Nutrition Policy Program, Ithaca, NY.*.

Sahn, D. E. and A. Gerstle (2001). Child allowances and allocative decisions in Romania households. *Working Paper #115, Cornell Food and Nutrition Policy Program, Ithaca, NY.*.

Sahn, D. E. and S. Younger (2000). Dominance testing of transfers in romania. *Review of Income and Wealth 46*(3), 309–327.

Svejnar, J. (1999). Labor markets in the transitional Central and East European economies. In O. Ashenfelter and D. Card (Eds.), *Handbook of Labor Economics - Vol. 3b*, pp. 2809–2858. Amsterdam: Elsevier Science.

Terrell, K. and V. Storm (1999). Labor market policies and unemployment in the Czech republic. *Journal of Comparative Economics 27*, 33–60.

Voicu, A. (2002). Employment dynamics in the Romanian labor market: A Markov Chain Monte Carlo approach. *IZA DP No. 438, Bonn Germany*.

Wu, X. (2002). Embracing the market: Entry into self-employment in transitional China, 1978-1996. *William Davidson Working Paper Number 512*.

Table 1: Frequencies - Labor Market Status

		1994		1995
Employed	4175	67.7%	4162	67.5%
Unemployed	697	11.3%	584	9.5%
Self-Employed	1296	21.0%	1422	23.0%
	6168	100.0	6168	100.0

Table 2: Frequencies - Labor Market Status

		1995		1996
Employed	4725	68.3%	4769	68.9%
Unemployed	649	9.4%	461	6.7%
Self-Employed	1544	23.4%	1688	24.4%
	6918	100.0	6918	100.0

Table 3: Average Transition Rates

	Current Status				
Previous Status	1	2	3	4	
1-Employed	94.1	2.0	1.0	2.8	100
	93.8	*31.9*	*19.3*	*8.1*	
2-Unemployed	25.9	32.9	16.7	24.5	100
with benefits	*2.6*	*51.7*	*31.2*	*7.0*	
3- Unemployed	29.0	9.9	36.9	24.2	100
w/o benefits	*1.5*	*7.9*	*35.2*	*3.6*	
4-Self-Employed	6.8	1.7	2.4	89.1	100
	2.2	*8.5*	*14.4*	*81.4*	
	100	*100*	*100*	*100*	

Table 4: Summary Statistics

Status	Employed		Unemployed with benefits		Unemployed w/o benefits		Self-Employed	
N	(N=8931)		(N=567)		(N=478)		(N=3110)	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Gender (1=male)	0.59	0.49	0.49	0.50	0.48	0.50	0.42	0.49
Age	39.04	9.24	34.83	11.11	33.40	10.23	42.19	12.29
Years of education	11.53	2.87	10.12	2.52	10.40	2.62	7.84	2.91
Less than high school	0.03	0.16	0.06	0.24	0.09	0.28	0.28	0.45
Completed middle school	0.18	0.39	0.26	0.44	0.20	0.40	0.43	0.50
High school degree	0.33	0.47	0.37	0.48	0.39	0.49	0.15	0.35
Professional degree	0.34	0.47	0.30	0.46	0.32	0.47	0.14	0.34
Higher education degree	0.12	0.32	0.00	0.06	0.01	0.11	0.00	0.07
Married	0.83	0.37	0.64	0.48	0.63	0.48	0.82	0.39
Separated	0.04	0.19	0.05	0.23	0.06	0.23	0.03	0.16
Household size	3.75	1.35	4.01	1.67	4.10	1.70	4.05	1.84
Urban	0.68	0.47	0.47	0.50	0.62	0.49	0.11	0.31

Table 5: Coefficients - Dynamic Mixed Multinomial Logit

	3-States Model		4-States Model		
Status	Unemp.	Self-Emp.	Unemp.		Self-Emp.
			with ben.	no ben.	
$y_{(t-1)2} = 1$	3.718***	3.290***	3.727***	3.805***	3.230***
	(0.094)	(0.110)	(0.121)	(0.154)	(0.124)
$y_{(t-1)3} = 1$	2.493***	5.144***	2.516***	4.447***	3.394***
	(0.139)	(0.104)	(0.195)	(0.163)	(0.159)
$y_{(t-1)4} = 1$			1.878***	3.226***	5.139***
			(0.186)	(0.185)	(0.104)
Gender (1=male)	-0.770**	1.054***	-0.456	-1.131***	1.032***
	(0.313)	(0.314)	(0.370)	(0.416)	(0.314)
Age	0.009	-0.026	0.003	0.015	-0.026
	(0.035)	(0.033)	(0.042)	(0.048)	(0.033)
Age squared	0.006	0.094**	0.043	-0.042	0.093**
	(0.044)	(0.039)	(0.052)	(0.061)	(0.039)
Male × Age	0.015*	-0.033***	0.005	0.026**	-0.033***
	(0.008)	(0.008)	(0.010)	(0.012)	(0.008)
Age×Years of school	-0.004***	-0.003***	-0.005***	-0.002**	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Middle school	-0.093	-0.221	0.408	-0.739**	-0.239
	(0.230)	(0.208)	(0.289)	(0.306)	(0.209)
High school degree	0.055	-0.565*	0.660*	-0.714*	-0.587**
	(0.302)	(0.290)	(0.377)	(0.398)	(0.291)
Professional degree	0.186	-0.546*	0.538	-0.186	-0.551*
	(0.305)	(0.287)	(0.380)	(0.403)	(0.289)
Higher education	-0.891	-0.444	-0.817	-1.420**	-0.482
	(0.546)	(0.502)	(0.867)	(0.694)	(0.503)
Married	-0.319**	0.331**	-0.393***	-0.222	0.341***
	(0.126)	(0.130)	(0.152)	(0.168)	(0.131)
Separated	0.134	0.214	0.059	0.225	0.226
	(0.218)	(0.244)	(0.262)	(0.288)	(0.245)
Household size	0.028	0.054**	0.013	0.047	0.054**
	(0.027)	(0.026)	(0.033)	(0.036)	(0.026)
Urban	-0.151	-1.545***	-0.490***	0.355**	-1.526***
	(0.105)	(0.108)	(0.127)	(0.145)	(0.109)
Urban × Professional	-0.062	-0.002	0.330	-0.599**	-0.032
	(0.180)	(0.203)	(0.220)	(0.241)	(0.203)
Constant	-1.899***	-1.980***	-2.374***	-3.001***	-1.979***
	(0.649)	(0.629)	(0.776)	(0.873)	(0.630)

NOTE: Standard Errors in Parentheses
Statistical significance: *=10%; **=5%; ***=1%

Table 6: Coefficients - Dynamic Mixed Multinomial Logit with Endogenous Initial Conditions

	3-States Model		4-States Model		
Status	Unemp.	Self-Emp.	Unemp.		Self-Emp.
			with ben.	no ben.	
$y_{(t-1)2} = 1$	5.356 **	3.466 ***	4.312 ***	8.426 ***	3.686 ***
	(2.316)	(0.711)	(0.301)	(1.522)	(0.541)
$y_{(t-1)3} = 1$	2.793 *	5.180 ***	3.559 ***	11.327 ***	4.256 ***
	(1.463)	(0.287)	(0.283)	(1.847)	(0.880)
$y_{(t-1)4} = 1$			2.454 ***	6.182 ***	5.612 ***
			(0.481)	(1.715)	(0.724)
Gender (1=male)	-1.310 **	1.120 ***	-0.521	-2.284 **	1.106 ***
	(0.657)	(0.394)	(0.446)	(0.903)	(0.382)
Age	0.020	-0.025	-0.007	-0.024	-0.027
	(0.074)	(0.041)	(0.051)	(0.102)	(0.042)
Age squared	-0.012	0.094 *	0.057	-0.017	0.099 *
	(0.091)	(0.051)	(0.065)	(0.128)	(0.054)
Male × Age	0.028 *	-0.035 ***	0.006	0.058 **	-0.035 ***
	(0.017)	(0.010)	(0.012)	(0.025)	(0.010)
Age×Years of school	-0.005 ***	-0.003 ***	-0.006 ***	-0.005 **	-0.003 ***
	(0.002)	(0.001)	(0.001)	(0.002)	(0.001)
Middle school	0.021	-0.268	0.368	-0.641	-0.283
	(0.334)	(0.261)	(0.330)	(0.633)	(0.275)
High school degree	0.232	-0.617 *	0.601	-0.574	-0.638 *
	(0.461)	(0.336)	(0.425)	(0.844)	(0.355)
Professional degree	0.498	-0.613 *	0.534	0.753	-0.577 *
	(0.498)	(0.332)	(0.429)	(0.892)	(0.348)
Higher education	-0.832	-0.511	-0.879	-1.134	-0.534
	(0.702)	(0.575)	(0.887)	(1.322)	(0.594)
Married	-0.560 **	0.327 **	-0.429 **	-0.613	0.338 **
	(0.262)	(0.154)	(0.183)	(0.390)	(0.154)
Separated	0.101	0.209	0.020	0.026	0.253
	(0.352)	(0.278)	(0.333)	(0.665)	(0.298)
Household size	0.034	0.057 *	0.017	0.078	0.058 *
	(0.046)	(0.029)	(0.039)	(0.074)	(0.031)
Urban	-0.017	-1.580 ***	-0.483 ***	1.307 ***	-1.624 ***
	(0.332)	(0.135)	(0.185)	(0.491)	(0.158)
Urban × Professional	-0.151	-0.010	0.274	-1.384 ***	-0.035
	(0.274)	(0.222)	(0.238)	(0.530)	(0.234)
Constant	-3.155	-1.986 **	-2.371 **	-8.704 ***	-2.086 **
	(2.183)	(0.774)	(0.946)	(2.373)	(0.811)

NOTE: Standard Errors in Parentheses
Statistical significance: *=10%; **=5%; ***=1%

Table 7: Coefficients - Mixed Multinomial Logit for Initial Conditions

	3-States Model		4-States Model		
Status	Unemp.	Self-Emp.	Unemp.		Self-Emp.
			with ben.	no ben.	
Gender (1=male)	-1.249 ***	0.550 ***	-1.357 ***	-1.063 ***	0.543 ***
	(0.222)	(0.201)	(0.262)	(0.372)	(0.201)
Age	-0.194 ***	-0.193 ***	-0.193 ***	-0.192 ***	-0.192 ***
	(0.027)	(0.020)	(0.033)	(0.044)	(0.020)
Age squared	0.214 ***	0.316 ***	0.226 ***	0.183 ***	0.315 ***
	(0.034)	(0.024)	(0.042)	(0.055)	(0.024)
Male × Age	0.022 ***	-0.040 ***	0.022 ***	0.022 **	-0.039 ***
	(0.006)	(0.005)	(0.007)	(0.011)	(0.005)
Age×Years of school	-0.004 ***	-0.006 ***	-0.005 ***	-0.002 **	-0.006 ***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Middle school	0.157	-0.047	0.654 ***	-0.697 ***	-0.028
	(0.177)	(0.133)	(0.242)	(0.263)	(0.134)
High school degree	0.155	-0.847 ***	0.762 **	-0.881 ***	-0.821 ***
	(0.231)	(0.193)	(0.313)	(0.335)	(0.194)
Professional degree	0.320	-0.640 ***	0.845 ***	-0.497	-0.616 ***
	(0.231)	(0.189)	(0.306)	(0.353)	(0.190)
Higher education	-1.233 ***	-2.062 ***	-1.089 *	-1.997 ***	-2.037 ***
	(0.423)	(0.474)	(0.656)	(0.581)	(0.475)
Married	-0.486 ***	0.021	-0.357 ***	-0.726 ***	0.026
	(0.091)	(0.078)	(0.114)	(0.145)	(0.078)
Separated	0.239	0.381 ***	0.407 **	-0.048	0.387 ***
	(0.151)	(0.144)	(0.188)	(0.282)	(0.145)
Household size	0.105 ***	0.072 ***	0.102 ***	0.108 ***	0.072 ***
	(0.018)	(0.016)	(0.024)	(0.029)	(0.016)
Urban	-0.372 ***	-2.378 ***	-0.695 ***	0.268 **	-2.376 ***
	(0.073)	(0.077)	(0.087)	(0.127)	(0.076)
Urban × Professional	-0.092	-0.018	0.093	-0.457 **	-0.021
	(0.126)	(0.163)	(0.154)	(0.221)	(0.163)
Constant	3.921 ***	4.868 ***	3.182 ***	3.140 ***	4.842 ***
	(0.474)	(0.392)	(0.576)	(0.773)	(0.393)

NOTE: Standard Errors in Parentheses
Statistical significance: *=10%; **=5%; ***=1%

Table 8: Marginal Effects - Dynamic Mixed Multinomial Logit

	3-States Model		4-States Model		
Status	Unemp.	Self-Emp.	Unemp.		Self-Emp.
			with ben.	no ben.	
$y_{(t-1)2} = 1$	0.218***	0.272***	0.118***	0.089***	0.270***
	(0.010)	(0.012)	(0.009)	(0.006)	(0.013)
$y_{(t-1)3} = 1$	0.126***	0.449***	0.073***	0.106***	0.288***
	(0.011)	(0.019)	(0.008)	(0.008)	(0.016)
$y_{(t-1)4} = 1$			0.045***	0.070***	0.453***
			(0.008)	(0.007)	(0.020)
Gender (1=male)	-0.057***	0.101***	-0.019	-0.033***	0.099***
	(0.019)	(0.028)	(0.013)	(0.011)	(0.028)
Age	0.001	-0.002	0.000	0.000	-0.002
	(0.002)	(0.003)	(0.001)	(0.001)	(0.003)
Age squared	-0.000	0.009**	0.001	-0.001	0.008**
	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)
Male × Age	0.001**	-0.003***	0.000	0.001***	-0.003***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)
Age×Years of school	-0.000***	-0.000***	-0.000***	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Middle school	-0.005	-0.019	0.016	-0.019**	-0.021
	(0.014)	(0.018)	(0.010)	(0.008)	(0.019)
High school degree	0.008	-0.052**	0.027**	-0.018*	-0.054**
	(0.019)	(0.026)	(0.013)	(0.010)	(0.026)
Professional degree	0.016	-0.051**	0.022	-0.004	-0.052**
	(0.019)	(0.026)	(0.013)	(0.010)	(0.026)
Higher education	-0.055	-0.034	-0.026	-0.036**	-0.037
	(0.034)	(0.045)	(0.030)	(0.018)	(0.045)
Married	-0.023***	0.032***	-0.015***	-0.006	0.033***
	(0.008)	(0.012)	(0.005)	(0.004)	(0.012)
Separated	0.007	0.018	0.001	0.005	0.020
	(0.014)	(0.022)	(0.009)	(0.007)	(0.022)
Household size	0.001	0.005**	0.000	0.001	0.005**
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Urban	0.001	-0.139***	-0.012***	0.014***	-0.138***
	(0.007)	(0.010)	(0.005)	(0.004)	(0.010)
Urban × Professional	-0.004	0.000	0.013	-0.016***	-0.002
	(0.011)	(0.018)	(0.008)	(0.006)	(0.018)

NOTE: Standard Errors in Parentheses
Statistical significance: *=10%; **=5%; ***=1%

Table 9: Marginal Effects - Dynamic Mixed Multinomial Logit: Men

	3-States Model		4-States Model		
Status	Unemp.	Self-Emp.	Unemp.		Self-Emp.
			with ben.	no ben.	
$y_{(t-1)2} = 1$	0.178***	0.220***	0.093***	0.074***	0.219***
	(0.011)	(0.013)	(0.011)	(0.007)	(0.014)
$y_{(t-1)3} = 1$	0.108***	0.339***	0.061***	0.084***	0.230***
	(0.011)	(0.019)	(0.009)	(0.008)	(0.016)
$y_{(t-1)4} = 1$			0.037***	0.059***	0.342***
			(0.008)	(0.007)	(0.020)
Age	0.003	-0.000	0.001	0.001	0.000
	(0.002)	(0.003)	(0.001)	(0.001)	(0.003)
Age squared	-0.001	0.003	0.000	-0.001	0.003
	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)
Age×Years of school	-0.000***	-0.000***	-0.000***	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Middle school	-0.008	0.002	0.010	-0.019**	0.002
	(0.015)	(0.018)	(0.010)	(0.009)	(0.018)
High school degree	0.009	-0.005	0.024*	-0.017	-0.006
	(0.020)	(0.025)	(0.013)	(0.011)	(0.026)
Professional degree	0.010	-0.010	0.016	-0.007	-0.010
	(0.019)	(0.025)	(0.013)	(0.011)	(0.025)
Higher education	-0.024	0.034	-0.013	-0.026	0.034
	(0.035)	(0.042)	(0.032)	(0.018)	(0.043)
Married	-0.028***	-0.009	-0.012**	-0.015***	-0.008
	(0.009)	(0.012)	(0.006)	(0.005)	(0.012)
Separated	0.014	0.007	-0.006	0.013	0.010
	(0.018)	(0.025)	(0.014)	(0.009)	(0.025)
Household size	0.003	0.003	0.001	0.001	0.003
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)
Urban	-0.003	-0.080***	-0.012**	0.011**	-0.079***
	(0.008)	(0.011)	(0.005)	(0.004)	(0.011)
Urban × Professional	-0.002	-0.007	0.010	-0.012*	-0.009
	(0.012)	(0.017)	(0.008)	(0.007)	(0.017)

NOTE: Standard Errors in Parentheses
Statistical significance: *=10%; **=5%; ***=1%
⌟N = 7091

Table 10: Marginal Effects - Dynamic Mixed Multinomial Logit: Women

	3-States Model		4-States Model		
Status	Unemp.	Self-Emp.	Unemp.		Self-Emp.
			with ben.	no ben.	
$y_{(t-1)2} = 1$	0.272***	0.321***	0.153***	0.104***	0.322***
	(0.021)	(0.025)	(0.017)	(0.013)	(0.027)
$y_{(t-1)3} = 1$	0.143***	0.569***	0.088***	0.130***	0.338***
	(0.022)	(0.042)	(0.016)	(0.016)	(0.033)
$y_{(t-1)4} = 1$			0.055***	0.076***	0.576***
			(0.016)	(0.013)	(0.042)
Age	-0.001	-0.012*	-0.001	0.001	-0.012*
	(0.005)	(0.006)	(0.003)	(0.003)	(0.006)
Age squared	0.002	0.021***	0.003	-0.001	0.021***
	(0.006)	(0.008)	(0.004)	(0.003)	(0.008)
Age×Years of school	-0.000***	-0.000	-0.000***	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Middle school	0.002	-0.075*	0.028	-0.020	-0.080**
	(0.030)	(0.039)	(0.022)	(0.016)	(0.040)
High school degree	0.011	-0.145***	0.035	-0.016	-0.152***
	(0.038)	(0.055)	(0.028)	(0.020)	(0.056)
Professional degree	0.032	-0.123**	0.036	0.002	-0.128**
	(0.040)	(0.056)	(0.030)	(0.020)	(0.057)
Higher education	-0.108	-0.258**	-0.038	-0.053	-0.270**
	(0.077)	(0.112)	(0.061)	(0.041)	(0.113)
Married	-0.015	0.111***	-0.018*	0.005	0.112***
	(0.015)	(0.025)	(0.010)	(0.008)	(0.025)
Separated	0.010	0.084**	0.005	0.005	0.085**
	(0.023)	(0.040)	(0.015)	(0.013)	(0.041)
Household size	-0.001	0.010**	-0.003	0.002	0.011**
	(0.003)	(0.005)	(0.003)	(0.002)	(0.005)
Urban	0.010	-0.223***	-0.012	0.021***	-0.222***
	(0.012)	(0.021)	(0.009)	(0.007)	(0.021)
Urban × Professional	-0.006	-0.033	0.017	-0.021*	-0.038
	(0.024)	(0.043)	(0.018)	(0.012)	(0.044)

NOTE: Standard Errors in Parentheses
Statistical significance: *=10%; **=5%; ***=1%
_N = 5995