

The Sources of Transition Probabilities in Turkish Labour Market: An Empirical Evidence for Overlapping Individual Data, 2007- 2008

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Analysis of the state transition probabilities in labour market has become one of the indicators for evaluating the labour market efficiency. The state transition plays an important role in terms of acquiring knowledge and determination of basic factors in labour market. In this paper, the state transition probabilities are computed by the means of Markov process from the same periods of two year individual panel data, the Turkish quarterly data for 2007 and 2008, which is robust concerning the attrition problem that is mentioned in the literature. As a following stage, multinomial logistic regression model is employed to take the possible dynamics of transition probabilities into account such as: age, gender, urban-rural distinction, education, employment status and occupation. The results indicate that the Turkish labour market have been affected negatively during the global financial and economic crisis.

1. Introduction

Analysis of the state transitions plays an important role in terms of acquiring knowledge and determination of basic factors in labour markets. Markov models are widely used in literature for calculating transition probabilities concerning different perspectives and countries. A couple of examples are: Huilfeldt (1996) for Czech Republic; Foley (1997) and Grogan (2000) for Russia; Francesconi (1999) for the United States; Hazans, Earnets and Earle (2003) for Lithuania, Estonia and Latvia; Bellman, Estrin and Svejnar (1995) for Germany; Eamets (1999) for Estonia; Nielsen and Risa (2000) for Norway; Christodoulakis and

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Mamatzakis (2010) for Greece; Wolterman (2002) for Brazil concentrate on state transitions. Concerning the case for Turkey, Tansel and Tasci (2005) provide the determinants of transition probabilities for the period from 2000 to 2001 by using the Household Labour Force Survey (HLFS) panel data and only consider the gender based multinomial logit models.

This paper aims to investigate the labour market transition probabilities by using the sample obtained from the original micro HLFS data span 2007 and 2008 for Turkey. Our research question is whether the state transition probabilities in the Turkish labour market had been affected from the global and financial crisis in 2008. The state transitions in third and fourth quarters of the following two years 2007-2008 can be indicators for realizing the effects of global economic and financial crisis in the labour market.

In order to obtain transition probabilities, Markov models were firstly taken into consideration. As a second step, the multinomial logistic models were applied to examine the dynamics of state transition probabilities. The latter gave us an opportunity to compare the labour market transition behavior.

2. Data and Methodology

2.1. Data

The original micro data set of the Household Labour Force Survey (HLFS) of Turkish Statistical Institute (TurkStat) is used in this study. HLFS provides detailed information about the status of the labour force. The sampling unit of HLFS is household addresses. It has a rotational sampling pattern providing four visits to particular addresses as fifty percent of them overlapping within same periods of following two years as shown in the time framework (see Appendix A-5). Since the sampling unit of HLFS consists of household addresses, there may be a possible attrition problem because of internal migration of individuals which is also stressed by Tunali (2009) for the years 2000-2002.

This paper benefits from the original micro data provided by TurkStat for the expert thesis. The same individuals were taken into account and the data has no existing attrition problem. We processed the micro data set of HLFS carefully by focusing on the same individuals in

overlapping addresses. In order to construct the panel data for the same individuals; the variables such as the same address number, the same household and the same individual order number had been considered. A key is defined for each individual as consisting of the same address number, same household and same individual order number for the overlapping following two year's same periods according to the rotation scheme provided in Appendix-A5. Considering this key number, the validity of the panel data is confirmed by also checking the age and gender of the individuals in the panel data. Consequently, it is become definite that the individuals regarding the HLFS are the same individuals. Therefore we may clearly claim that the attrition problem is solved.

To give more information concerning the data set used in the paper: The number of individuals for the year 2007 and 2008 is 481.605 and 481.154 respectively. We divided the overlapping household, overlapping individual sample within four equal periods. Between 2007 and 2008; the number of the overlapping same individuals is 42.334 for the Period1, 43.212 for the Period2, 43.601 for the Period3 and 45.844 for the Period4. This study is concerned with the overlapping data of individuals owning ages 15 and older. The number of individuals whom are 15 and older is 29.692 for the Period1, 30.405 for the Period2, 31.100 for the Period3 and 32.581 for the Period4 within the years. The reason for considering this age group is that TurkStat's HLFS data compiling methodology covers the population whom are 15 years old and older.

2.2. Methodology

Initially, the Markov chain models are used to determine the transition probabilities among the labour market states where these states are discrete (Searle and Willett, 2001, p. 373). The state transition probabilities are computed by the means of Markov process (assumption of two consecutive period is connected each other by means of state-transition matrices) from the same periods of two year individual panel data after being separated from individual base micro data as periodical three month Period1 (January, February, March), Period2 (April, May, June), Period3 (July, August, September), Period4 (October, November, December).

The balance of labour state transitions are based on the closed system showing the flow of one to another. Three labour market states can be considered such as: Employed (*Emp*), Unemployed (*Une*), Not-in-the-labour force (*Nlf*). The labour market transition probability of the individuals at time t is given by the matrix X_t representing the number of the population in labour market states.

$$X_t = \begin{bmatrix} Emp_t \\ Une_t \\ Nlf_t \end{bmatrix} \quad (1)$$

The matrix for X_{t+1} is represented by (2). The outflows (between different labour market states) are the ones whom transit from one state to other labour states. The inflows (within same labour market states) represent the transitions within the same labour states.

$$X_{t+1} = \begin{bmatrix} Emp - Emp & Une - Emp & Nlf - Emp \\ Emp - Une & Une - Une & Nlf - Une \\ Emp - Nlf & Une - Nlf & Nlf - Nlf \end{bmatrix} X_t \quad (2)$$

Generally the Markov property is written as $\Pr[X_{t+1} = x_i | X_t = x_k] \equiv p_{ik}$ where $p_{ik} \geq 0$ for all i, k and the sum of probabilities is one, $p_{i1} + p_{i2} + \dots + p_{in} = 1$ for each $i = 1, \dots, n$. (Hamilton, 1994, pp. 678-679). They cannot be negative. The term p_{ik} in the specification shows a transition probability and there is a transition of x_i to x_k (see Acemoglu, 2009, p. 538). n -state Markov matrix can be compiled from p_{mn} transition probabilities. The state transition probability of the unemployed person at time t and employed at time $t+1$ is calculated as $p_{Une-Emp} = Une_t - Emp_{t+1} / Une_t$. The general representation is presented in (3) where F_{ik} is the number of transitions in state i at time t who are in state k at time $t+1$. S_i is the total number of individuals whom are in state i at time t .

$$p_{ik} = \frac{F_{ik}}{S_i} \quad i, k = Emp, Une, Nlf \quad (3)$$

The next period X_{t+1} is attached to X_t by the state - transition matrix (STM) which consists of nine potential probabilities. The STM can be expressed by (4).

$$STM = \begin{bmatrix} P_{emp-emp} & P_{emp-une} & P_{emp-nlf} \\ P_{une-emp} & P_{une-une} & P_{une-nlf} \\ P_{nlf-emp} & P_{nlf-une} & P_{nlf-nlf} \end{bmatrix} \quad (4)$$

In this study; state transition probabilities are calculated by taking transitions from t : 2007 to t : 2008. There are nine potential transitions summarized as follows:

- emp-emp*: Employed within the years 2007 and 2008.
- emp-une*: Employed in 2007 but unemployed in 2008.
- emp-nlf*: Employed in 2007 but not in labour force in 2008.
- une-emp*: Unemployed in 2007 but employed in 2008.
- une-une*: Unemployed in 2007 and 2008.
- une-nlf*: Unemployed in 2007 but not in labour force in 2008.
- nlf-emp*: Not in labour force in 2007 but employed in 2008.
- nlf-une*: Not in labour force in 2007 but unemployed in 2008.
- nlf-nlf*: Not in labour force in 2007 and not in labour force in 2008.

As the next step, we used the multinomial logit regression analysis to examine the dynamics affecting the state transitions. The explanatory variables are: age, gender, urban-rural distinction, educational status, employment status, Nomenclature of Territorial Units for Statistics 1 (NUTS) and occupational status. There are also other studies such as Tansel and Tasci (2005) using the similar model and explanatory variables.

We tried several models and identified the most fit one among the alternative models by multinomial logit regression. The state transitions are explained by the related categorical variables and their levels within the labour force. The categorical variables and their levels are as follows: Age groups variable is leveled as 15-24, 25-34, 35-44, 45-54 and 55+; the urban and rural distinction variable; gender variable; Nomenclature of Territorial Units of Statistics Level 1 (*NUTS 1*) variable consisting of the regions in Turkey: Istanbul, Western Marmara,

Aegean, Eastern Marmara, Western Anatolia, Mediterranean, Middle Anatolia, Western Black Sea, Eastern Black Sea, North Eastern Anatolia, Middle East Anatolia, South Eastern Anatolia. The educational status variable is leveled as non-graduate, primary and middle school, high school, vocational high school, two-year university and four-year university and over. The occupational status is taken as professionals, legislators, elementaries, senior officials, technicians and associate professionals, shop sales workers, craft and related trade workers, plant and machine operators and assemblers, skilled agricultural and fishery workers, clerks, service workers. The employment status is classified as regular employee, casual employee, employer, own account worker, and unpaid family worker.

Multinomial logistic regression is a method used when the dependent variable is observed within two, three or multi categories. It is a regression method when the expected value of the dependent variable according to the explanatory variable is obtained as a probability. Normal distribution and continuity assumptions are not necessary. In order to select an appropriate model, a test statistic given in (5) which has a chi-square distribution is used. Rejecting of the null (all the coefficients except for constant are zero) indicated that the model is appropriate. The detailed results will be presented if demanded.

$$D = -2 * \ln \left(\frac{\text{Likelihood function for the null hypothesis}}{\text{Likelihood function for alternative hypothesis}} \right) \quad (5)$$

The dependent variable in equation (6) X is nominal which consists of levels that cannot be ordered in any meaningful way, also known as categorical and more than two categories. X represents transitions from employed to a different labour force state (*emp-une*, *emp-nlf*, *emp-emp*) and transitions from unemployment to another labour force state (*une-emp*, *une-nlf*, *une-une*). And transition from not in labour force to another labour force state (*nlf-emp*, *nlf-une*, *nlf-nlf*).

$$Pr(X_{i+1} = x_j | X_{it} = x_k) = \frac{\exp(\beta'_j Z_i)}{\sum_k \exp(\beta'_k Z_i)} \quad j, k = 1, 2, 3 \quad i = 1, 2, \dots, n \quad (6)$$

Z_{ijk} is for the individual characteristics of the i^{th} individual moving from state k to state j (see also Lauerova and Terrell, 2002). Z vector's

covariates consist of gender, age, urban-rural, periods, education, marital status, occupational status, employment status and NUTS. The estimation results are presented in Table 2a-2c. The probability values for the coefficients in multinomial logistic regression are significant if they are below 0.05. The positive coefficient is significant at 5 percent level indicates that the realization probability of the labour transition is higher or less compared to the reference labour state.

To give an example for interpreting results: Assume that the gender dummy variable goes from zero to one when the other conditions are fixed. The marginal effect of the probability (γ_{ik}) is given by (7) where β_i and β_k are the elements of the coefficient vector β .

$$\gamma_{ik} = P_i \left[\beta_i - \sum_k \beta_k \right] \quad (7)$$

3. Empirical Evidence

3a. Estimation Results for the Transition Probabilities

Table 1a Panel A provides the number of individuals in the labour market transitioning from one state to another for the full sample considering the four different periods. Panel B and C give the results for male and female individuals. Panels D-H take the age groups: 15-24, 25-34, 35-44, 45-54 and 55+ into account. Finally the Panel I and J distinct the sample as urban and rural criteria. In order to calculate the transition probabilities under Markov property by the state transition matrix (STM) we benefit from ‘the number of individuals’ in labour market transitions according to related groups in Table 1a. Then the transition probabilities in Table 1b are calculated. We briefly summarize the main findings in this section. It is interesting to see for the total that the out of labour force state (nlf) in 2007 had preserved its situation in 2008 and has the highest transition probability (Table 1b, Panel A). The outflow is mostly observed among unemployed people. Transition probability from employed to unemployed situation increases within the third and fourth quarters. It can be claimed that the global financial and economic crisis affected employment market negatively. An increase in the transition probability for unemployed to employed individuals is highest in the second quarter can be evaluated by the increase in agricultural employment.

Table 1b, Panel B and C present the labour market transition probabilities according to the gender criteria. Probabilities of being employed from three states (*emp-emp*, *une-emp*, *nlf-emp*) are lower for females compared to males. While the direct flow (inflow) probability of saving the present situation (*emp-emp*, *une-une*) is lower for females compared with the males, *nlf-nlf* inflow is higher for females than males. For males and females, the probability of being employed to unemployed increases by the effect of global economic crisis within the third and fourth quarters. The probability transition from unemployed to employed is higher for males compared with the females. However, during the third and fourth quarters, the probability of being out of labour force (*emp-nlf*) is quiet higher for females compared with males. As a result, we may claim that the risks such as being discouraged and going out of labour force are higher for females and gender differentiation is apparent.

The age groups for 25-34 and 35-44 (see Tables 1b, Panel D through H for the labour market transition probabilities according to the age groups) tend to preserve their current situation of employed and they have high probability of being employed. In all the age groups, the transition probability concerning the current labour situation to other labour situations is highest for the unemployed. The age group 55 and over has a high transition probability of being unemployed to out-of-the labour force. Among the age group of 55 and over, the transition probability of being out-of-the labour force to out-of-labour force is quietly high and the probability of being employed is lowest for all the states.

The transition probabilities concerning the rural-urban distinction are given in the Table 1b, Panel I and J. The *emp-emp* transition is higher in urban than the rural places. The outflow movement from the unemployed was observed highly for both rural and urban places. The probability of being employed (*une-emp*, *nlf-emp*) is lower for urban places compared to the rural places. Concerning the rural places, the probability of being out-of-the labour force to being employed is higher than the urban places. This result is consistent with the argument that the agricultural employment increased during the crisis. Probability of being out-of-the labour force to unemployed is higher for the urban than the rural places. It can be interpreted as most of the people living in rural

places became discouraged to opportunities of finding a job compared with urban places.

3b. Multinomial Logistic Regression Model Estimation Results

Table (2a, 2b, 2c) presents the estimated β coefficients for different transitions. Effects of each independent variable on realization probability of relevant labour market states can be analyzed. While the significantly negative coefficients indicate that the realization probability of the relevant labour transition is lower compared to the reference level; the significantly positive coefficients indicate that the realization probability of the relevant labour transition is higher compared to the reference labour state. The last level of the variable is the reference level which is a benchmark.

In order to evaluate of the results of estimates, we interpret the results of the exponential effects which is the exponential of the beta coefficient $\exp(\beta)$. The odds ratio of the coefficient $\exp(\beta)$ indicates how many times the independent variable's realization probability can be observed higher or lower according to the reference level. (see Ozdamar, 1999).

Table 1a. Transition Number of Individuals

Panel A. Transitions of Individuals by Period, Total									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>	<i>nlf-nlf</i>
Period 1	9 535	466	1 618	504	408	384	1 436	396	14 945
Period 2	10 622	450	1 683	499	278	310	1 686	373	14 504
Period 3	10 751	499	1 699	337	333	491	1 811	418	14 761
Period 4	10 651	560	1 562	586	418	343	1 821	514	16 126
Panel B. Transitions of Individuals by Period, Male									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	7 488	385	786	320	407	222	3 575	670	218
Period 2	8 109	374	772	200	406	167	3 498	696	205
Period 3	8 306	419	785	231	384	175	3 506	722	214
Period 4	8 303	461	759	306	495	195	3 944	783	274
Panel C. Transitions of Individuals by Period, Female									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	2 047	81	832	88	97	162	11 370	766	178
Period 2	2 513	76	911	78	93	143	11 006	990	168
Period 3	2 445	80	914	102	107	162	11 255	1089	204
Period 4	2 348	99	803	112	91	148	12 182	1 038	240
Panel D. Transitions of Individuals by Age Group, 15 - 24									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	1 164	113	285	131	183	120	3 381	435	172
Period 2	1 279	106	284	98	155	112	3 346	510	157
Period 3	1 353	119	364	126	175	132	3 177	548	214
Period 4	1 293	137	260	120	197	105	3 487	478	225
Panel E. Transitions of Individuals by Age Group, 25 - 34									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	2 823	162	240	153	168	88	2 392	244	85
Period 2	3 167	155	261	75	172	80	2 201	292	103
Period 3	3 121	176	237	99	159	88	2 208	304	89
Period 4	3 103	194	251	152	169	80	2 469	314	99
Panel F. Transitions of Individuals by Age Group, 35 - 44									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	3 024	127	283	87	94	83	2 237	269	66
Period 2	3 150	131	276	66	98	49	2 114	270	43
Period 3	3 160	124	268	63	101	46	2 103	295	49
Period 4	3 331	138	259	81	144	58	2 301	327	89
Panel G. Transitions of Individuals by Age Group, 45 - 54									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	1 691	55	386	31	52	67	2 445	247	52
Period 2	1 989	49	388	29	65	45	2 370	255	51
Period 3	2 071	62	361	40	42	53	2 471	281	42
Period 4	1 950	72	357	56	64	73	2 682	318	75
Panel H. Transitions of Individuals by Age Group, 55+									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	833	9	424	6	7	26	4 490	241	21
Period 2	1 037	9	474	10	9	24	4 473	359	19
Period 3	1 046	18	469	5	14	18	4 802	383	66
Period 4	974	19	435	9	12	27	5 187	384	26
Panel I. Transitions of Individuals by Rural Urban Distinction, Rural									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	3 262	107	817	74	120	89	3 867	689	92
Period 2	3 976	91	802	41	118	53	3 625	864	72
Period 3	4 153	118	832	48	130	56	3 826	898	86
Period 4	3 854	121	791	73	135	69	4 239	872	110
Panel J. Transitions of Individuals by Rural Urban Distinction, Urban									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	6 273	359	801	334	384	295	11 078	747	304
Period 2	6 646	359	881	237	381	257	10 879	822	301
Period 3	6 598	381	867	285	361	281	10 935	913	332
Period 4	6 797	439	771	345	451	274	11 887	949	404

Table 1b. Transition Probabilities

Panel A. Transition Probabilities by Period, Total									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>	<i>nlf-nlf</i>
Period 1	82.06	4.01	13.93	38.89	31.48	29.63	8.56	2.36	89.08
Period 2	83.28	3.53	13.19	45.91	25.57	28.52	10.18	2.25	87.57
Period 3	83.03	3.85	13.12	29.03	28.68	42.29	10.66	2.46	86.88
Period 4	83.39	4.38	12.23	43.5	31.03	25.46	9.86	2.78	87.35
Panel B. Transition Probabilities by Period, Male									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	86.48	4.45	9.08	33.72	42.89	23.39	80.1	15.01	4.88
Period 2	87.62	4.04	8.34	25.87	52.52	21.6	79.52	15.82	4.66
Period 3	87.34	4.41	8.25	29.24	48.61	22.15	78.93	16.25	4.82
Period 4	87.19	4.84	7.97	30.72	49.7	19.58	78.86	15.66	5.48
Panel C. Transition Probabilities by Period, Female									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	69.16	2.74	28.11	25.36	27.95	46.69	92.33	6.22	1.45
Period 2	71.8	2.17	26.03	24.84	29.62	45.54	90.48	8.14	1.38
Period 3	71.1	2.33	26.58	27.49	28.84	43.67	89.7	8.68	1.63
Period 4	72.25	3.05	24.71	31.91	25.93	42.17	90.51	7.71	1.78
Panel D. Transition Probabilities by Age Group, 15 - 24									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	74.52	7.23	18.25	30.18	42.17	27.65	84.78	10.91	4.31
Period 2	76.63	6.35	17.02	26.85	42.47	30.68	83.38	12.71	3.91
Period 3	73.69	6.48	19.83	29.1	40.42	30.48	80.65	13.91	5.43
Period 4	76.51	8.11	15.38	28.44	46.68	24.88	83.22	11.41	5.37
Panel E. Transition Probabilities by Age Group, 25 - 34									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	87.53	5.02	7.44	37.41	41.08	21.52	87.91	8.97	3.12
Period 2	88.39	4.33	7.28	22.94	52.6	24.46	84.78	11.25	3.97
Period 3	88.31	4.98	6.71	28.61	45.95	25.43	84.89	11.69	3.42
Period 4	87.46	5.47	7.07	37.91	42.14	19.95	85.67	10.9	3.44
Panel F. Transition Probabilities by Age Group, 35 - 44									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	88.06	3.7	8.24	32.95	35.61	31.44	86.98	10.46	2.57
Period 2	88.56	3.68	7.76	30.99	46.01	23	87.1	11.12	1.77
Period 3	88.96	3.49	7.55	30	48.1	21.9	85.94	12.06	2
Period 4	89.35	3.7	6.95	28.62	50.88	20.49	84.69	12.04	3.28
Panel G. Transition Probabilities by Age Group, 45 - 54									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	79.32	2.58	18.11	20.67	34.67	44.67	89.1	9	1.9
Period 2	81.99	2.02	15.99	20.86	46.76	32.37	88.57	9.53	1.91
Period 3	83.04	2.49	14.47	29.63	31.11	39.26	88.44	10.06	1.5
Period 4	81.97	3.03	15.01	29.02	33.16	37.82	87.22	10.34	2.44
Panel H. Transition Probabilities by Age Group, 55+									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	65.8	0.71	33.49	15.38	17.95	66.67	94.49	5.07	0.44
Period 2	68.22	0.59	31.18	23.26	20.93	55.81	92.21	7.4	0.39
Period 3	68.23	1.17	30.59	13.51	37.84	48.65	91.45	7.29	1.26
Period 4	68.21	1.33	30.46	18.75	25	56.25	92.67	6.86	0.46
Panel I. Transition Probabilities by Rural Urban Distinction, Rural									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	77.93	2.56	19.52	26.15	42.4	31.45	83.2	14.82	1.98
Period 2	81.66	1.87	16.47	19.34	55.66	25	79.48	18.94	1.58
Period 3	81.38	2.31	16.3	20.51	55.56	23.93	79.54	18.67	1.79
Period 4	80.86	2.54	16.6	26.35	48.74	24.91	81.19	16.7	2.11
Panel J. Transition Probabilities by Rural Urban Distinction, Urban									
Periods	<i>emp-emp</i>	<i>emp-une</i>	<i>emp-nlf</i>	<i>une-emp</i>	<i>une-une</i>	<i>une-nlf</i>	<i>nlf-nlf</i>	<i>nlf-emp</i>	<i>nlf-une</i>
Period 1	84.39	4.83	10.78	32.97	37.91	29.12	91.33	6.16	2.51
Period 2	84.28	4.55	11.17	27.09	43.54	29.37	90.64	6.85	2.51
Period 3	84.09	4.86	11.05	30.74	38.94	30.31	89.78	7.5	2.73
Period 4	84.89	5.48	9.63	32.24	42.15	25.61	89.78	7.17	3.05

Transition probability from employed to unemployed.- The results of the multinominal regression analysis are given in Table 2a, 2b and 2c. The probability of transition from employed to unemployed is higher for males than females. Concerning the age group, the age group of 15+ is more than 55+. The transition is lower for the ones living in rural than the urban.

Concerning the education group; the probability of transition from employed to unemployed is higher for the ones in the elementary school, primary education, secondary school or occupational secondary school group than the four year university graduates. This indicates when the education level of the individuals increases, the probability of transition from employed to unemployed diminishes. For the period distinction, the transition probability is lower in the second and third periods compared with the fourth quarter. The marital status indicates that the transition probability from employed to unemployed is higher for the singles than the married individuals. When we analyze the occupational group distinction, legislators, senior officials and managers, professionals, technicians and associate professionals, clerks, skilled agricultural and fishery workers, have a lower transition probability of being employed to unemployed than the jobs which do not need qualification. Regarding the transition probability from employed to unemployed, regular employee, casual employee, employers and own account workers have a higher transition probability than the unpaid family workers. When we analyze the *NUTS* region distinction, the transition from employed to unemployed is higher for West Black Sea, East Black Sea and Northeast Anatolia regions than the Southeast Anatolia Region.

The transition probability from employed to out-of-labour force.- It is higher for females than the males. This transition probability is lower for the age groups of 15-24, 25-34, 35-44, 45-54 than the age group 55+. This transition probability is lower for the individuals living in rural areas compared with the urban ones. Considering the education group distinction, the transition probability from employed to the out-of-labour force decreases by the education level. The transition probability from employed to out-of-labour force is higher for the first period than the fourth period. Considering the marital status, the transition probability from employed to out-of-labour force is higher for the unmarried than the married ones. Considering the occupation group distinction, the

transition probability from employed to out-of-labour force diminishes according to the reference level. The probability diminishes for the regular workers compared to the irregular workers. The transition probability is higher in Istanbul, Western Marmara, Aegean, Eastern Marmara, Western Anatolia, Mediterranean, Western Black Sea, Eastern Black Sea and North Eastern Anatolia compared with South Eastern Anatolia.

Transition probability from unemployed to employed.- Considering the gender variable, it is higher for the males compared with the females. The probability diminishes when the age group increases. The rural workers have higher probability compared with the urban workers. It is higher for the second period compared with the fourth quarter. The unmarried sample has a lower probability than the married ones. It is interesting to observe that NUTS regional distinction has no effect on the transition probability.

Transition probability from unemployed to out-of-labour force.- This probability is higher for the male compared with the female individuals. It diminishes when the age group increases. The rural workers have lower transition probability compared with the urban workers. The probability diminishes by the education level. Married individuals have higher probability compared with the unmarried ones. The probability is lower compared with the Southeast Anatolia region.

Transition probability from out-of-labour force to employment.- Considering the gender, the transition probability is higher for males compared with females. It is higher for the youth individuals compared with the elders. The sample living in the rural regions has a higher transition probability when it is compared with the urban workers. The probability of finding a job increases by the education level. The third period has a higher probability compared with the fourth period. The unmarried individuals have a lower probability compared with the married ones. Considering the regional distinction, the Southeast Anatolia region has a lower transition probability when it compared with the other regions.

Transition probability from out-of-labour force to unemployed.- The transition probability is higher for males compared with the females. The transition probability diminishes for older age groups. The

probability diminishes by the education level. The married ones have lower probability compared with the unmarried ones. The South Eastern Anatolia has a higher probability compared with the other regions.

Table 2a. Multinomial Logistic Regression Results

Variables	<i>x: emp-une</i>					<i>x: emp-nlf</i>				
	β	Std Error	Wald	Prob.	exp(β)	β	Std Error	Wald	Prob.	exp(β)
constant	4.709*	0.277	289.834	0.000		0.641*	0.143	20.129	0.000	
[gender=1]	0.152*	0.070	4.776	0.029	1.164	-1.487*	0.038	1,531.899	0.000	0.226
[gender=2]	0(b)					0(b)				
[agegroup=1]	0.816*	0.164	24.689	0.000	2.262	-0.868*	0.064	184.525	0.000	0.420
[agegroup=2]	0.778*	0.152	26.201	0.000	2.176	-1.701*	0.053	1,012.467	0.000	0.183
[agegroup=3]	0.637*	0.151	17.794	0.000	1.891	-1.709*	0.051	1,145.103	0.000	0.181
[agegroup=4]	0.503*	0.156	10.340	0.001	1.653	-0.852*	0.046	345.156	0.000	0.426
[agegroup=5]	0(b)					0(b)				
[urbanrural=1]	0.371*	0.066	32.004	0.000	0.690	-0.399*	0.040	97.363	0.000	0.671
[urbanrural=2]	0(b)					0(b)				
[educgrp=1]	0.227	0.173	1.719	0.190	1.255	0.604*	0.114	28.211	0.000	1.830
[educgrp=2]	0.297*	0.142	4.347	0.037	1.345	0.557*	0.106	27.408	0.000	1.746
[educgrp=3]	0.240	0.148	2.623	0.105	1.271	0.436*	0.112	15.068	0.000	1.547
[educgrp=4]	0.170	0.150	1.287	0.257	1.186	0.308*	0.115	7.180	0.007	1.360
[educgrp=5]	0.033	0.176	0.034	0.853	1.033	0.103	0.128	0.644	0.422	1.109
[educgrp=6]	0(b)					0(b)				
[period1=1]	-0.062	0.067	0.864	0.353	0.940	0.215*	0.042	26.188	0.000	1.240
[period2=2]	0.249*	0.068	13.484	0.000	0.779	0.012	0.042	0.090	0.765	1.013
[period3=3]	0.164*	0.066	6.205	0.013	0.849	-0.027	0.042	0.426	0.514	0.973
[period4=4]	0(b)					0(b)				
[maristat=1]	0.849*	0.071	144.719	0.000	2.338	0.145*	0.048	9.023	0.003	1.156
[maristat=2]	0(b)					0(b)				
[occupation=1]	0.454*	0.130	12.247	0.000	0.635	-0.467*	0.080	33.770	0.000	0.627
[occupation=2]	0.898*	0.189	22.620	0.000	0.407	-0.571*	0.126	20.598	0.000	0.565
[occupation=3]	0.526*	0.129	16.565	0.000	0.591	-0.431*	0.094	21.168	0.000	0.650
[occupation=4]	0.382*	0.123	9.583	0.002	0.683	-0.571*	0.094	37.270	0.000	0.565
[occupation=5]	-0.042	0.087	0.227	0.634	0.959	-0.004	0.062	0.004	0.949	0.996
[occupation=6]	0.633*	0.125	25.453	0.000	0.531	-0.080	0.054	2.188	0.139	0.923
[occupation=7]	0.046	0.076	0.365	0.546	1.047	0.035	0.057	0.382	0.537	1.036
[occupation=8]	-0.051	0.089	0.324	0.569	0.950	-0.177*	0.069	6.477	0.011	0.838
[occupation=9]	0(b)					0(b)				
[empstat=1]	0.813*	0.141	33.076	0.000	2.254	-0.682*	0.056	148.997	0.000	0.506
[empstat=2]	2.061*	0.146	198.348	0.000	7.852	0.538*	0.064	71.155	0.000	1.712
[empstat=3]	0.425*	0.201	4.457	0.035	1.530	-0.420*	0.095	19.627	0.000	0.657
[empstat=4]	0.957*	0.146	42.924	0.000	2.603	0.009	0.049	0.037	0.848	1.009
[empstat=5]	0(b)					0(b)				
[NUTS=1]	0.179	0.109	2.711	0.100	1.196	-0.357*	0.076	22.171	0.000	0.700
[NUTS=2]	-0.254	0.138	3.407	0.065	0.776	-0.624*	0.079	61.657	0.000	0.536
[NUTS=3]	-0.010	0.108	0.008	0.928	0.990	-0.243*	0.066	13.717	0.000	0.784
[NUTS=4]	-0.124	0.119	1.096	0.295	0.883	-0.411*	0.074	30.667	0.000	0.663
[NUTS=5]	-0.135	0.124	1.170	0.279	0.874	-0.452*	0.081	31.356	0.000	0.636
[NUTS=6]	-0.019	0.111	0.031	0.860	0.981	-0.733*	0.070	108.238	0.000	0.480
[NUTS=7]	-0.098	0.149	0.428	0.513	0.907	-0.129	0.085	2.275	0.132	0.879
[NUTS=8]	0.524*	0.132	15.725	0.000	0.592	-1.021*	0.073	195.219	0.000	0.360
[NUTS=9]	0.797*	0.205	15.143	0.000	0.451	-0.908*	0.089	105.230	0.000	0.403
[NUTS=10]	0.342*	0.171	3.996	0.046	0.710	-0.796*	0.089	79.789	0.000	0.451
[NUTS=11]	0.211	0.139	2.285	0.131	1.235	-0.114	0.080	2.016	0.156	0.893
[NUTS=12]	0(b)					0(b)				

* represents the significance at the five percent level. (b) represents the reference level.

Table 2b. Multinomial Logistic Regression Results

Variables	<i>x: une-emp</i>					<i>x: une-nlf</i>				
	β	Std Error	Wald	Prob.	exp(β)	β	Std Error	Wald	Prob.	exp(β)
constant	-0.225	0.323	0.484	0.486		1.770*	0.329	28.877	0.000	
[gender=1]	0.380*	0.092	17.051	0.000	1.462	-	1.276*	0.096	176.582	0.000
[gender=2]	0(b)	-	-	-	-	0(b)	-	-	-	-
[agegroup=1]	0.795*	0.267	8.894	0.003	2.214	-	1.099*	0.248	19.647	0.000
[agegroup=2]	0.396	0.256	2.402	0.121	1.486	-	1.586*	0.236	45.134	0.000
[agegroup=3]	0.244	0.256	0.907	0.341	1.276	-	1.566*	0.237	43.744	0.000
[agegroup=4]	0.080	0.265	0.090	0.764	1.083	-	0.735*	0.241	9.315	0.002
[agegroup=5]	0(b)	-	-	-	-	0(b)	-	-	-	-
[urbanrural=1]	0.437*	0.097	20.359	0.000	1.549	0.229*	0.111	4.273	0.039	1.257
[urbanrural=2]	0(b)	-	-	-	-	0(b)	-	-	-	-
[educgrp=1]	0.066	0.204	0.106	0.745	1.069	1.213*	0.230	27.895	0.000	3.365
[educgrp=2]	0.067	0.150	0.198	0.657	1.069	0.705*	0.184	14.669	0.000	2.024
[educgrp=3]	-0.137	0.167	0.675	0.411	0.872	0.950*	0.195	23.780	0.000	2.586
[educgrp=4]	-0.013	0.168	0.006	0.940	0.987	0.612*	0.201	9.214	0.002	1.843
[educgrp=5]	-0.016	0.201	0.006	0.936	0.984	0.264	0.241	1.196	0.274	1.302
[educgrp=6]	0(b)	-	-	-	-	0(b)	-	-	-	-
[period1=1]	-0.152	0.097	2.453	0.117	0.859	0.194	0.109	3.135	0.077	1.214
[period2=2]	0.280*	0.103	7.378	0.007	1.323	0.296*	0.118	6.293	0.012	1.344
[period3=3]	0.100	0.100	0.998	0.318	1.105	0.223*	0.114	3.830	0.050	1.249
[period4=4]	0(b)	-	-	-	-	0(b)	-	-	-	-
[maristat=1]	-	0.654*	0.102	40.822	0.000	0.520	-	0.499*	0.115	18.916
[maristat=2]	0(b)	-	-	-	-	0(b)	-	-	-	-
[NUTS=1]	0.180	0.152	1.398	0.237	1.197	-	0.563*	0.175	10.372	0.001
[NUTS=2]	-0.123	0.198	0.390	0.532	0.884	-	0.693*	0.220	9.965	0.002
[NUTS=3]	0.132	0.152	0.759	0.384	1.142	-	-0.298	0.170	3.077	0.079
[NUTS=4]	0.090	0.165	0.298	0.585	1.094	-	0.559*	0.188	8.844	0.003
[NUTS=5]	0.304	0.170	3.175	0.075	1.355	-	0.425*	0.194	4.799	0.028
[NUTS=6]	-0.215	0.154	1.952	0.162	0.807	-	0.669*	0.171	15.262	0.000
[NUTS=7]	-	0.025*	0.215	0.013	0.908	0.976	-0.018	0.224	0.007	0.934
[NUTS=8]	-0.074	0.172	0.188	0.665	0.928	-	0.610*	0.194	9.915	0.002
[NUTS=9]	-0.116	0.233	0.249	0.618	0.890	-	0.890*	0.277	10.328	0.001
[NUTS=10]	-0.435	0.249	3.057	0.080	0.647	-0.519	0.276	3.526	0.060	0.595
[NUTS=11]	-0.231	0.193	1.437	0.231	0.794	-0.075	0.203	0.136	0.713	0.928
[NUTS=12]	0(b)	-	-	-	-	0(b)	-	-	-	-

* represents the significance at the five percent level. (b) represents the reference level.

Table 2c. Multinomial Logistic Regression Results

Variables	x: nlf-emp					x: nlf-une				
	β	Std Error	Wald	Prob.	exp(β)	β	Std Error	Wald	Prob.	exp(β)
constant	-3.140*	0.113	772.768	0.000		-5.177*	0.200	669.287	0.000	
[gender=1]	1.150*	0.031	1,339.081	0.000	3.158	1.594*	0.060	715.433	0.000	4.922
[gender=2]	0(b)					0(b)				
[agegroup=1]	1.050*	0.051	432.206	0.000	2.858	2.168*	0.133	267.236	0.000	8.737
[agegroup=2]	1.128*	0.049	521.208	0.000	3.088	2.735*	0.128	458.979	0.000	15.413
[agegroup=3]	1.215*	0.048	632.711	0.000	3.370	2.537*	0.131	372.902	0.000	12.648
[agegroup=4]	0.777*	0.046	287.208	0.000	2.175	1.752*	0.129	183.474	0.000	5.767
[agegroup=5]	0(b)					0(b)				
[urbanrural=1]	1.133*	0.029	1,542.933	0.000	3.106	0.076	0.065	1.358	0.244	1.079
[urbanrural=2]	0(b)					0(b)				
[educgrp=1]	-0.810*	0.098	68.566	0.000	0.445	-1.655*	0.155	114.351	0.000	0.191
[educgrp=2]	-0.798*	0.094	72.549	0.000	0.450	-1.350*	0.134	101.623	0.000	0.259
[educgrp=3]	-0.651*	0.102	40.334	0.000	0.522	-0.675*	0.142	22.634	0.000	0.509
[educgrp=4]	-0.633*	0.110	32.879	0.000	0.531	-0.416*	0.150	7.651	0.006	0.660
[educgrp=5]	-0.547*	0.144	14.465	0.000	0.579	-0.210	0.189	1.235	0.267	0.811
[educgrp=6]	0(b)					0(b)				
[period1=1]	-0.176*	0.039	20.386	0.000	0.839	-0.221*	0.071	9.751	0.002	0.802
[period2=2]	0.047	0.038	1.558	0.212	1.048	-0.247*	0.072	11.720	0.001	0.781
[period3=3]	0.114*	0.037	9.516	0.002	1.121	-0.111	0.070	2.539	0.111	0.895
[period4=4]	0(b)					0(b)				
[maristat=1]	-0.204*	0.040	25.447	0.000	0.815	0.485*	0.080	36.475	0.000	1.624
[maristat=2]	0(b)					0(b)				
[NUTS=1]	-0.163*	0.064	6.558	0.010	0.850	-0.209	0.118	3.155	0.076	0.812
[NUTS=2]	0.074	0.075	0.985	0.321	1.077	0.588*	0.127	21.321	0.000	1.801
[NUTS=3]	0.102	0.056	3.363	0.067	1.108	0.119	0.107	1.244	0.265	1.126
[NUTS=4]	0.297*	0.064	21.391	0.000	1.345	0.204	0.121	2.832	0.092	1.226
[NUTS=5]	0.210*	0.067	9.976	0.002	1.234	0.230*	0.121	3.626	0.057	1.258
[NUTS=6]	0.360*	0.059	37.846	0.000	1.434	0.623*	0.106	34.308	0.000	1.865
[NUTS=7]	-0.254*	0.084	9.102	0.003	0.775	-0.228	0.159	2.058	0.151	0.796
[NUTS=8]	0.550*	0.059	86.892	0.000	1.733	0.195	0.124	2.484	0.115	1.215
[NUTS=9]	0.907*	0.076	141.338	0.000	2.476	0.225	0.180	1.562	0.211	1.252
[NUTS=10]	0.642*	0.068	90.387	0.000	1.900	-0.195	0.173	1.268	0.260	0.823
[NUTS=11]	0.053	0.067	0.627	0.428	1.054	0.101	0.134	0.575	0.448	1.107
[NUTS=12]	0(b)					0(b)				

* represents the significance at the five percent level. (b) represents the reference level.

4. Conclusion

The transition probabilities of the labour force are calculated for the HSFL data span from 2007 to 2008. This data gives an opportunity to evaluate the effects of the recent global economic crisis on the labour market in Turkey. Evaluating the number of people who are joining to the labour force after being unemployed for some time, and being employed or not-in-the-labour force are critical. Thus, it plays an essential role to calculate state transition probabilities and evaluate the basic factors affecting. Multinomial logistic regression enabled us to evaluate the transitions of the labour force states by comparing related variables' reference level.

The main results obtained are as follows: (1) When the labour force transition probabilities are considered, the highest transition probability owns to the transition from not-in-the-labour force to not-in-the-labour force. (2) Highest outflow probability is observed for the unemployed. (3) During the economic crisis, the transition from employed to unemployed for the youth and female increased tremendously. Females are not employed adequately, and tend to lose their jobs with respect to males. (4) The probability of being employed in rural areas is lower than the ones living in the urban areas. Probability of transition from the unemployed to the employed is higher in rural areas than the urban. (5) Increasing the education level contributes to the probability of being employed. The low level of education effects the inflow movement of labour force and the duration of job creation. (6) Complementary to this fact, the qualified jobs create easier employment opportunities. (7) Married ones tend to be employed rather than the unmarried ones with regard to the marital status. (8) The effect of the regional distinction on the transitions is significant for the transition from the employed to the unemployed.

Appendix - A1 Definitions of the variables and levels

Gender = 1: Male
Gender = 2: Female
Age Group = 1: 15-24
Age Group = 2: 25-34
Age Group = 3: 35-44
Age Group = 4: 45-54
Age Group = 55+
Urban-rural = 1: Rural
Urban-rural = 2: Urban
Educational Status = 1: Non graduate
Educational Status = 2: Primary and middle school
Educational Status = 3: High school
Educational Status = 4: Vocational high school
Educational Status = 5: Two and three year university
Educational Status = 6: Four year and over university
Period1 = 1: Period 1 (January-February-March)
Period2 = 2: Period 2 (April-May-June)
Period3 = 3: Period 3 (July-August-September)
Period4 = 4: Period 4 (October-November-December)
Marital Status = 1: Non-married
Marital Status = 2: Married
Occupational Group = 1: Legistors, senior officials and managers
Occupational Group = 2: Professionals
Occupational Group = 3: Technicians and associate professionals
Occupational Group = 4: Clerks
Occupational Group = 5: Service workers, shop and market sales workers
Occupational Group = 6: Skilled agricultural and fishery workers
Occupational Group = 7: Craft and related trade workers
Occupational Group = 8: Plant and machine operators and assemblers
Occupational Group = 9: Elementaries
Employment Status = 1: Regular employee
Employment Status = 2: Casual employee
Employment Status = 3: Employer
Employment Status = 4: Own account worker
Employment Status = 5: Unpaid family worker
NUTS = 1: Istanbul
NUTS = 2: Western Marmara
NUTS = 3: Aegean
NUTS = 4: Eastern Marmara
NUTS = 5: Western Anatolia
NUTS = 6: Mediterranean
NUTS = 7: Middle Anatolia
NUTS = 8: Western Black Sea
NUTS = 9: Eastern Black Sea
NUTS = 10: North Eastern Anatolia
NUTS = 11: Middle East Anatolia
NUTS = 12: South Eastern Anatolia

Appendix - A2 Descriptive characteristics of the data for employed individuals in 2007

		Number of Individuals	Marginal Percentage
X	emp-emp	40 486	83.1%
	emp-une	1 876	3.8%
	emp-nlf	6 375	13.1%
Gender	Male	35 940	73.7%
	Female	12 797	26.3%
Age Group	15-24	6 299	12.9%
	25-34	13 387	27.5%
	35-44	14 093	28.9%
	45-54	9 313	19.1%
	55+	5 645	11.6%
Urban-Rural	Rural	18 458	37.9%
	Urban	30 279	62.1%
Education Group	Non-graduate	5 201	10.7%
	primary and middle school	27 527	56.5%
	High School	4 980	10.2%
	Vocational High School	4 908	10.1%
	Two-year or three-year university	2 175	4.5%
	Four-year university and over	3 946	8.1%
Period	Period 1 (January-February-March)	11 320	23.2%
	Period 2 (April-May-June)	12 402	25.4%
	Period 3 (July-August-September)	12 579	25.8%
	Period 4 (October-November-December)	12 436	25.5%
Marital Status	Non- Married	9 591	19.7%
	Married	39 146	80.3%
Occupational Status	Legislators, senior officials and managers	4 481	9.2%
	Professionals,	2 814	5.8%
	Technicians and associate professionals	3 012	6.2%
	Clerks,	2 815	5.8%
	Service workers, shop and market sales workers	5 323	10.9%
Occupational Status	Skilled agricultural and fishery workers	11 546	23.7%
	Craft and related trade workers	6 739	13.8%
	Plant and machine operators and assemblers	5 150	10.6%
	Elementaries	6 857	14.1%
Employment Status	Regular Workers	23 582	48.4%
	Causal Workers	3 487	7.2%
	Employers	2 809	5.8%
	Self-Employed	11 930	24.5%
	Unpaid Family Workers	6 929	14.2%
NUTS	Istanbul	5 613	11.5%
	Western Marmara	3 350	6.9%
	Aegean	8 107	16.6%
	Eastern Marmara	4 829	9.9%
	Western Anatolia	3 686	7.6%
	Mediterranean	5 776	11.9%
	Middle Anatolia	2 181	4.5%
	Western Black Sea	5 453	11.2%
	Eastern Black Sea	2 226	4.6%
	North Eastern Anatolia	2 225	4.6%
	Middle East Anatolia	2 346	4.8%
South Eastern Anatolia	2 945	6.0%	
Total		48 737	100.0%

Appendix A-3: Descriptive characteristics of the data for unemployed individuals in 2007

		Number of Individuals	Marginal Percentage
X	une-une	1 354	29.2%
	une-emp	1 959	42.3%
	une-nlf	1 321	28.5%
Gender	Male	3 321	71.7%
	Female	1 313	28.3%
Age group	15-24	1 550	33.4%
	25-34	1 378	29.7%
	35-44	949	20.5%
	45-54	595	12.8%
	55+	162	3.5%
Urban -Rural	Rural	934	20.2%
	Urban	3 700	79.8%
Educational Group	Non-graduate	394	8.5%
	Primary and middle school	2 415	52.1%
	High School	686	14.8%
	Vocational High School	595	12.8%
	Two-year or three-year university	246	5.3%
	Four-year university and over	298	6.4%
Period	Period 1 (January-February-March)	1 216	26.2%
	Period 2 (April-May-June)	1 038	22.4%
	Period 3 (July-August-September)	1 106	23.9%
	Period 4 (October-November-December)	1 274	27.5%
Marital status	Non-Married	2 167	46.8%
	Married	2 467	53.2%
	Istanbul	638	13.8%
	Western Marmara	236	5.1%
	Aegean	668	14.4%
	Eastern Marmara	443	9.6%
	Western Anatolia	419	9.0%
	Mediterranean	585	12.6%
	Middle Anatolia	214	4.6%
	Western Black Sea	368	7.9%
	Eastern Black Sea	142	3.1%
	North Eastern Anatolia	115	2.5%
	Middle East Anatolia	275	5.9%
South Eastern Anatolia	531	11.5%	
Total		4 634	100.0%

Appendix A-4: Descriptive characteristics of the data for not-in-labour force individuals in 2007

		Number of Individ.	Marginal Percentage
X	nlf-nlf	58 817	87.7%
	nlf-emp	6 576	9.8%
	nlf-une	1 648	2.5%
Gender	Male	17 876	26.7%
	Female	49 165	73.3%
Age group	15-24	15 733	23.5%
	25-34	10 606	15.8%
	35-44	10 020	14.9%
	45-54	11 055	16.5%
	55+	19 627	29.3%
Urban-Rural	Rural	18 641	27.8%
	Urban	48 400	72.2%
Educational group	Non-graduate	19 038	28.4%
	Primary and middle school	37 180	55.5%
	High School	5 693	8.5%
	Vocational High School	3 099	4.6%
	Two-year or three-year university	957	1.4%
	Four-year university and over	1 074	1.6%
Period	Period 1 (January-February-March)	16 369	24.4%
	Period 2 (April-May-June)	16 145	24.1%
	Period 3 (July-August-September)	16 535	24.7%
	Period 4 (October-November-December)	17 992	26.8%
Marital status	Non-Married	21 053	31.4%
	Married	45 988	68.6%
NUTS	Istanbul	8 321	12.4%
	Western Marmara	3 745	5.6%
	Aegean	11 086	16.5%
	Eastern Marmara	6 237	9.3%
	Western Anatolia	5 467	8.2%
	Mediterranean	6 924	10.3%
	Middle Anatolia	3 473	5.2%
	Western Black Sea	5 906	8.8%
	Eastern Black Sea	1 644	2.5%
	North Eastern Anatolia	2 787	4.2%
	Middle East Anatolia	3 948	5.9%
	South Eastern Anatolia	7 503	11.2%
Total		67 041	100.0%

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Appendix A-5 Household rotations by periods and years

ANO SNO	Year																			
	2004				2005				2006				2007				2008			
	Period				Period				Period				Period				Period			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1	A																			
2	A	A																		
3	B	A	A																	
4	B	B	A	A																
5	A	B	B	A	A															
6	A	A	B	B	A	A														
7	B	A	A	B	B	A	A													
8	B	B	A	A	B	B	A	A												
9		B	B	A	A	B	B	A	A											
10			B	B	A	A	B	B	A	A										
11				B	B	A	A	B	B	A	A									
12					B	B	A	A	B	B	A	A								
13						B	B	A	A	B	B	A	A							
14							B	B	A	A	B	B	A	A						
15								B	B	A	A	B	B	A	A					
16									B	B	A	A	B	B	A	A				
17										B	B	A	A	B	B	A	A			
18											B	B	A	A	B	B	A	A		
19												B	B	A	A	B	B	A	A	
20													B	B	A	A	B	B	A	A
21														B	B	A	A	B	B	A
22															B	B	A	A	B	B
23																B	B	A	A	B
24																	B	B	A	A
25																		B	B	A
26																			B	B
27																				B

Notes: ANO: Subsample number. SNO: Order number. Detailed information will be provided if demanded.

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