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PATTERNS OF NON-EMPLOYMENT IN HUNGARY'S LEAST DEVELOPED REGIONS

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ABSTRACT

On the eve of 1999 the Hungarian government introduced a series of radical reforms, including a cutback of unemployment insurance benefits and the abolition of unemployment assistance for workers who have exhausted their unemployment insurance ('benefit exhausters'), on the assumption that the high levels of unemployment benefits combined with the availability of informal employment, accounted for the low level of job-search activity and job-finding.

This research is based on discrete time duration analysis using Labor Force Survey (LFS) panel data from 1997–1998 and examines the characteristics of non-employment in Hungary's poorest regions where 50% of the working-age population is formally non-employed, and explores the possible negative impact of the reform. In general, we found that the data do not support the assumption that transition-to-work probability is strongly affected by benefit receipt, and moreover raise concerns as to the impact of the reform for the poorest regions in terms of 'welfare risk.'

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1. Introduction

In December 1999 the Hungarian government introduced a new policy regime to combat the continuing problem of unemployment. The maximum duration of unemployment insurance benefit (UI) was reduced from 12 to 9 months,[1] flat-rate, means-tested unemployment assistance benefit (UA) for UI exhausters was abolished, and the long-term unemployed were only allowed to apply for means-tested social benefit, amounting to not less than the minimum pension but occasionally below the minimum wage, on the condition that they carry out 'socially useful work' for at least 30 days following their application. The new approach to the problem of unemployment was completed in February 2000 when the government prohibited the National Labor Center from publishing unemployment rates based on registry data.

These reforms were based on assumptions as to the nature of joblessness. In the debate leading up to the reforms the Hungarian Prime Minister and some members of the government blamed the generosity of unemployment benefits combined with the availability of informal employment, for the low level of job-search activity[2] and high level of total joblessness. The stringent measures put into effect in May 2000 were expected to increase job-search activity and thereby speed up the process of re-employment.[3]

Unfortunately, the reforms were not preceded by targeted research to assess the suitability of the planned policy actions and the relevance of the assumptions underlying them. No action was taken to predict how the reforms would affect the labor market in Hungary's poorest regions where the welfare risk implicit in the reform is particularly high. Research carried out by Galasi (1994) and Micklewright and Nagy (1994, 1995) questioning the disincentive effect of UI benefits, calling for a cautious evaluation of UA (Micklewright and Nagy 1998), hinting at inefficiencies in the public works program (Galasi et al 1999), and questioning the informational value of some key Labor Force Survey (LFS) data (Micklewright and Nagy 1999) was simply ignored.

This paper addresses the regional aspect of the new policy regime by examining the composition and flow patterns of non-employment in East and North-East Hungary where, at the end of the transition period, less than half the working-age population was in work as opposed to nearly two-thirds in the West and over three-fifths in other parts of Hungary. (For Hungary's regions see Appendix 3/Maps 1-3.) The relative position of these regions hardest hit by crisis has since deteriorated. In our opinion, any policy that generates radical change in the population's access to welfare assistance should take on board the implications for these depressed areas, which account for 40% of the non-employed who want a job.

Austerity measures of the type taken in Hungary may have a positive impact on depressed labor markets in the long run in cases where there is a strong causal link between access to informal employment and benefits and a low intensity of job-search activity, low job-finding probabilities, and high rates of joblessness. As unemployment rises and wages fall the return from searching and working diminishes which in turn leads to a potentially massive exclusion from the labor market in depressed areas. This is particularly the case if the unemployment-related benefits are flat-rate or regionally unadjusted and the returns to informal activities or household production do not substantially differ across regions. The strength of these effects is unknown and needs to be measured by an empirical study of flows between the state of different labor-markets.

Flows will be analyzed using samples of non-employed (and employed) men and women over time and estimating how personal, household and environmental characteristics affect their chances of finding employment (or remaining employed). Stock samples observed in the 1997:1 and 1997:3 waves of the LFS will be followed for 1.5 years by pooling observations from six consecutive quarterly waves, focusing on the impact of variables relating to job-search activity, receipt of benefits

[1] An exception was made for those in retraining courses prior to the expiry of their benefits, extending entitlement to UI for an additional year.

[2] This accounts for a wedge of 3–4 percentage points between the Labor Force Survey (LFS) based and registry-based unemployment rates and a gap of about 35 percentage points between search unemployment.

[3] It should be added that the Prime Minister's original plan was to set the maximum duration of UI at 3 months with no allowance made for those in retraining and a stronger emphasis on 'workfare.' The final outcome reflects a compromise between the Prime Minister and the Ministry of Family and Social Affairs.

and the availability of informal employment. In evaluating the results additional information will be drawn from the Household Budget Survey (HSB).

The data used here are clearly not ideal for flow analysis and the study of incentive effects and further the findings are subject to uncertainties due to the small sample size and the use of correlated region-level variables. The choice of such data and methodology was conditioned primarily by the lack of better sources of information.

The analysis is presented as follows. Section 2 gives a brief overview of Hungary's regions. Section 3 deals with the modeling of labor market flows within the limits of the available information. Section 4 presents the results of the discrete time duration models, focusing on regional turnover rates, job-search activity and the estimated effects of the hidden economy and benefits. Finally, the concluding section discusses the implications of the findings for research and policy.

2. Hungary's Regions

In preparing for its accession to the EU, Hungary created seven statistical macro-regions,[4] and we have taken this categorization in presenting the principal data. The composition of the working-age population is comprised of women aged 15–54 and men aged 15–59 for the first quarter of 1997 which is the starting date for our analysis (see Table 1).

In the Northern Plain (Szabolcs, Hajdú and Szolnok counties), and the Northern region (Borsod, Heves and Nódrád counties), only one out of every two prime-age adults was in work, and almost 40% was either unemployed or otherwise inactive. The latter ratio was almost twice as high as in the Western region (Gyõr, Vas and Zala (neighboring Austria) and Slovenia), and 50% higher than in other regions.

The composition of the male non-employed population in the depressed regions was biased towards those reporting that they 'wanted paid employment.' The proportion of job-seekers in this category sharply differed, however, between the Northern Plain, with the lowest rate of job-search activity, and the North with the highest rate. The proportion of women only 'wanting a job' was close to the national average in the Northern Plain but much higher in the North. The intensity of job-search activity was substantially below the national average in the former but close to the average in the latter.

Those in receipt of earnings-related, insurance-based UI benefits accounted for 5-12% of the non-employed population in the case of men and 5–7% in the case of women in the seven regions of the country. The regional differences in terms of UA receipt (means-tested, flat-rate benefit for UI exhausters, and equivalent to the minimum pension) were much larger. In the depressed regions 20–25% of the non-employed men, and 7–10% of women, received UA as opposed to the 14% and 6% national average ratios. On the national level, 33% of the working-age non-employed men not in receipt of a pension, childcare benefit or UI were supported by UA. This ratio was 44% in the Northern Plain and 52% in the North. For women the respective shares were 18, 25 and 31%.

These data highlight the fact that despite their similar employment ratios and some similarities in the composition of their non-employed population, there are major differences between the depressed Northern Plain and North (see Table 2). Both regions have low GDP and wage levels are characterized by a low share of tertiary sector activity, and low levels of business density (only slightly over half the national average in 1995). The list of dissimilarities starts with the ratio of LFS to registry unemployment (94% in the North but only 78% in the Northern Plain), followed by indicators of industrial composition. The urban centers in the North were heavily industrialized under socialism and, as suggested by the available estimates and proxies, have an undeveloped informal economy. By contrast, the Northern Plain is overwhelmingly rural and its informal economy appears to be large compared to the North but small compared to other rural areas. As regards the level of education, this is particularly low in the Northern Plain and relatively high in the North.

This information suggests that the extremely low employment levels in the North-East cannot be adequately accounted for by 'single-issue explanations.' The presence of a variety of possible

[4] See Map 1 in Appendix 3.

factors, differently mixed in two groups of counties, instead calls for an examination of the problem using individual observations.

Table 1 Composition of the working-age population (WAPOP), 1997:1 (%)

Regions	Central	West Trans-Danubian	North Trans-Danubian	South Plain	South Trans-Danubian	North Plain	North	Total
WAPOP=100								
Employed	61.6	65.6	58.5	58.9	56.0	48.9	50.5	57.5
Full-time student	15.7	13.9	14.1	13.5	13.7	13.1	12.4	14.1
Other (non-employed)	22.7	20.5	27.4	27.6	30.3	38.0	37.1	28.4
Non-employed=100								
Men								
Retired	44.8	38.7	44.5	46.3	50.7	41.2	40.6	43.7
In receipt of childcare benefit	0.5	0.0	1.0	0.3	0.5	0.3	0.8	0.5
Receives UI	11.0	14.9	12.9	18.2	12.5	12.1	11.4	12.9
Receives UA	5.6	8.6	12.3	8.7	11.8	20.2	24.4	14.1
Wants a job, but not searching	43.9	46.6	43.0	47.3	43.9	50.7	54.7	47.7
Actively searching for a job	30.7	35.8	29.3	25.3	27.1	26.7	37.1	30.4
Wants a job and actively searching	70.0	76.7	68.2	53.4	61.8	52.6	67.8	63.9
Women								
Retired	24.2	19.1	19.9	27.2	26.7	27.8	27.6	25.2
In receipt of childcare benefit	35.7	43.9	44.0	34.9	36.0	36.1	34.4	37.0
Receives UI	6.3	8.8	4.5	5.7	7.0	6.1	6.6	6.3
Receives UA	3.8	3.2	7.2	4.4	3.7	7.4	9.8	5.7
Wants a job, but not searching	25.2	22.3	27.9	26.9	29.3	27.6	36.7	28.1
Actively searching for a job	14.0	13.9	12.3	11.0	13.1	9.0	15.2	12.6
Wants a job and actively searching	55.6	61.0	44.0	41.0	44.6	32.7	41.4	44.9

Source: These figures have been computed using the original data file of the 1997.Q1 wave of the Labour Force Survey.

Table 2 Basic indicators of Hungary's macro-regions, 1997

	Central	West Trans-Danubian	North Trans-Danubian	South Plain	South Trans-Danubian	North Plain	North
				National average = 100			
GDP[1]	149	105	96	78	78	69	67
Personal income[2]	124	94	94	84	87	84	89
Educational level[5]	107	101	99	96	98	94	97
				%			
Employment ratio[3]	61.6	65.6	58.5	58.9	56.0	48.9	50.5
Unemployment rate (LFS)[3]	7.7	6.8	8.9	9.9	9.9	12.8	15.8
Unemployment rate (reg.)[3]	5.6	7.3	9.9	11.0	13.1	16.4	16.8
				Central region = 100			
Wages[4]	100	73	78	69	71	69	72
Wages (firms)[4]	100	74	81	68	71	69	73
Wages (firms, adjusted)[4]	100	91	95	88	87	84	84
Labor cost (firms, adjusted)[4]	100	96	99	92	92	90	90
				National average = 100			
Industrial structure							
Share of agriculture[5]	44	107	96	171	128	142	88
Share of trade[5]	122	109	99	97	103	95	90
Business density[6]	179	75	76	77	79	56	55
Proxies of the unregistered economy, based on:							
Electricity consumption (a)[7]	117	96	94	96	98	92	87
Electricity consumption (b)[7]	106	99	93	105	103	99	96
Electricity consumption (c)[7]	112	91	79	112	110	100	94
Employment (a)[8]	106	89	78	144	98	93	72
Employment (b)[9]	104	86	81	106	98	94	71

1) Central Statistical Office (1997).
2) Computed from municipality-level data collected by the Ministry of Finance in 1995. The data are available in the Central Statistical Office's TSTAR data base, upon purchase.
3) Figures based on LFS data relate to the population aged 15–55 and 15–59. Registry figure: computed from micro-region level data provided by the National Labor Center, 1997. The LFS-based rate compares the number of job seekers to the combined number of employed workers and job seekers. The registry-based rate compares the number of unemployed registered in labor offices to the sum of workers in employment and registered unemployed.
4) Budget institutions and firms employing 10 or more workers. 'Adjusted' stands for regression estimates holding gender, age, education, industry, firm size, ownership and, in the case of labor costs, the firm's productivity constant. Author's calculation from the National Labor Center's Wage Survey 1997.
5) 1990 Census. Educational level measured by the number of completed school-years for adult population.
6) Registered business establishments per 100 inhabitants 1995. Calculated from the CSO TSTAR database.
7) Mária Lackó's estimate using household electricity consumption data. (a) County level, Lackó (1999) (b) Micro-region level (c) Micro-region level, part of the informal economy related to agricultural activities. Lackó (2000b). For details see Section 3.
8) Those working at least one hour on the reference week without having an employment contract. All persons working at least one hour = 100. Mean value from the 1997–1998 waves of the LFS. See Section 3.
9) Same as 8) but sole-proprietors and assisting family members excluded.

3. Analyzing Flows: Modeling and Data

3.1. Modeling

In analyzing flows we rely on the standard assumptions of job-search theory, assuming that job-finding probabilities are affected by both reservation wages and 'job offer arrival rates.' The former are measured indirectly using household, individual and regional variables capturing income while non-employed, whereas the latter are approximated by means of variables depicting the markets where potential workers look for jobs.

Flows from non-employment to employment are analyzed using the 'easy estimation method for discrete time duration models' proposed by Jenkins (1995) for the 'serious but occasional econometrician.' The model is used to estimate how personal and environmental characteristics affect the probability that a 'spell' of non-employment. started t quarters ago will be interrupted by transition to work before the t+1 quarter.

Our samples consist of women aged 15-54 and men aged 15-59 who did not work, or worked less than one hour, in the week prior to interview in the 1997:1 or 1997:3 waves of the LFS.[5] The Hungarian LFS consists of a rotating panel with each cohort remaining in the sample for six quarters. Those in the stock samples or 'risk groups' are thus observed for up to 6 quarters, and may leave the risk group by entering employment or dropping out from the LFS, whichever occurs first.

As Jenkins (1995) shows, randomly selected stock samples observed at regular time intervals can be conveniently analyzed with discrete time duration models. The convenience stems from the fact that the model can be transformed into a binary choice model by transforming the data, notably, by treating quarterly (weekly, monthly) periods rather than individuals as the units of observation. Each individual contributes to the sample likelihood with as many quarterly periods as he or she has with a known outcome. In the transformed model the dichotomous dependent variable refers to a quarterly period: 1 represents transition-to-work, and 0 represents survival in non-employment. Periods ending in drop-out from the LFS are disclosed from the sample which is analogous to censoring in continuous-time hazard models. The model, if estimated with logit, has the form of:

$$(1) \qquad \ln[h(t)/(1-h(t))] = f(t) + \mathbf{b}'(\mathbf{X},\mathbf{Z}_t)$$

where h designates the conditional probability of transition-to-work between the t and t+1 quarters of joblessness, t stands for quarters spent in non-employment and X and Z_t are vectors of explanatory variables. The Z variables can change from one period to another during the observed period. Unless t varies in a very wide range the best choice for measuring duration effects is defining f(t) as $b'[t_1,t_2,...,t_K]$ where t_k= 1 if t=k and 0 otherwise. Unlike basic continuous-time duration models assuming non-constant hazard (such as Weibull) the b-s of the discrete-time model can capture non-monotonous changes in the baseline hazard.

In analyzing flows from employment to non-employment the focus of interest is slightly differently defined because the LFS provides no information on the duration of periods of employment. What is recorded is the job tenure of the respondent which allows us to analyze the probability that a period of employment started t quarters ago will be interrupted by transition to non-employment before the t+1 quarter.

Before starting, however, we discuss why the analysis addresses flows between employment and *non-employment* rather than between employment and unemployment. Secondly, a more detailed account is given of how the dependent variables were defined. Thirdly, we discuss the selection of the explanatory variables and specifications.

3.2. Why non-employment?

The analysis sets the dividing line between employment and non-employment rather than employment and job search for both general and specific reasons. Generally speaking, the usefulness of making an *ex ante* distinction between unemployment and non-participation in the labor market is

[5] Full-time students are classified as employed and a move to full-time education is treated as a transition-to-work.

debatable in an economy recovering from deep recession. Large flows returning back into the labor force in such periods have been observed in both the United States (Clark and Summers 1982) and Western Europe (Decressin and Fatás 1995; Jimeno and Bentolila 1998). This is expected to occur in Hungary too, as suggested in a recent paper by Micklewright and Nagy (1999) based on LFS data from 1997–1998 which showed that non-employed men actively searching (the 'unemployed'), and those who wanted a job without searching' (the 'inactive'), had the same probability of being hired during the survey period. This was not, however, the case for women.[6]

More specifically, some information leads to the suspicion that the Hungarian LFS crudely overestimates the rate of male inactivity. On the basis of the LFS statistics Hungary appears as a marked outlier with far the highest prime-age male non-participation rate in Europe: 15% as opposed to 11.9 in the Netherlands, and 9–11% in most European countries with low levels of employment (KILM 1999). Appendix Figure A1 compares LFS-based unemployment and inactivity rates in the population aged 25–54 for European countries where both figures are available.

Further doubts arise because the LFS unemployment figures are rumored to lag substantially behind the unpublished registry-based rate (6.6 *vs.* 10.4%). Moreover, the measures of 'job search activity' reported by the Central Statistical Office differ depending on how the questions are formulated. In 1996, when data on economic activity were simultaneously collected in the LFS, the Microcensus, and the Household Budget Survey (HBS), the rates for those aged 15–54/59 were 10.8%, 12.2% and 16.4%, respectively.[7] These surveys took job-search activity as the criterion of classification but the questions were put differently, with the LFS being the most restrictive in classifying people as 'unemployed.' The differences between the job-seeker/WAPOP ratios calculated from the LFS and the HBS were 6.0 percentage points for men and 3.7 for women.

In view of these features we chose to distinguish between the employed and non-employed and to let the estimation results tell us how to disentangle 'unemployment' from 'non-participation.'

3.3. Why 1997–1998?

The Hungarian LFS dates back to 1992 but the analysis has been limited to the waves between 1997:1 and 1998:4. Prior to 1995 those classified as 'inactive' were not asked about their duration of joblessness, and in the period 1995–1997 duration was coded very roughly for the 'inactive.' Consequently, 1997:1 is the first wave providing meaningful information on duration and 1998:4 is the last giving meaningful information on the size of the non-employed population, given that in 1999 no distinction was made between full-time students and other inactive persons.

3.4. Defining job-finding

A quarterly period is assumed to be interrupted by transition-to-work in two cases: (i) where the person is observed as non-employed in t, and employed in t+1; and (ii) where the person is observed as non-employed in both t and t+1 but reported a period of non-employment lasting less than three months in t+1. Participation in full-time education or study is treated as employment, and consequently students were excluded from the risk group, and a shift to full-time education is treated as transition-to-work. Workers were followed until transition or drop-out from the sample, that is, they were not 'allowed' to return to the risk group once they had left it. Those who became pensionable in 1998 were excluded from the analysis. And finally, the models were separately estimated for men and women.

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[6] The analysis is similar to that of Micklewright and Nagy (1999) in several respects: the dividing line has been set between employment and non-employment; flows are analyzed using discrete time duration models; panels constructed from consecutive waves of the LFS are used. I differ from their path of analysis at several points, however. While they studied an inflow sample, this paper will follow several stock samples. The emphasis will be on regional differentials, which was a secondary aspect in their paper. Finally, this paper examines flows in both directions.

[7] Own calculations using data from the Microcensus, the HBS and the 1996:2 wave of the LFS.

3.5. Explanatory variables: the individual level

Among the variables affecting the value of being 'non-employed,' we considered the number of children (distinguishing between children under 7, aged 7–15, and young men and women over the age of 15); household status (husband or wife, child, relative, other), employment status of the spouse, the dependent/wage-earner ratio of the household, and receipt by the respondent of pension, childcare benefit, UI or UA. (No information was available on social transfers received by other household members. Other social transfers were not reported in the LFS). The access to income while non-employed was approximated with region-level proxies of the informal economy discussed later in this section.

The number of job offers examined was assumed to depend on job-search behavior. Those classified as unemployed by the CSO, on the grounds that they were searching for, and ready to take up, employment, have been distinguished from those reporting that they simply wanted a job without searching for one. The latter group is broader than the CSO's category of 'discouraged workers,' which is limited to those who had become unemployed 'for economic reasons' as stated in the questionnaire.

The dummies for job-search and social transfers were time-varying, that is, they were allowed to differ between periods relating to the same individual. However, as shown by the survival analysis of Micklewright and Nagy (1999), and reinforced by my own calculations, those searching in the first quarter were likely to search throughout the survey period. This applies even more to workers in receipt of unemployment benefit.

Both search-related and benefit-related variables were tested using interactions with local unemployment and regional non-employment. As flat-rate benefits the UA increases the income replacement ratio by higher rates where unemployment is high and wages are low and is expected to have a stronger disincentive impact in depressed regions.[8] Job-search activity may have lower returns in high-unemployment regions where locating a vacancy is more costly.

Finally, we assumed that the probability of job-finding is (potentially) dependent on the duration of joblessness. Since the LFS only provides very basic information on workers and their work-careers, the time coefficients are also expected to capture changes over time in the composition of the risk group. (Those with a higher prior probability of job-finding are likely to leave the risk group more rapidly which results in a declining exit rate over time even in lack of duration dependence). Uncertainties also arise because the period of follow-up was relatively short in relation to the mean duration of periods of non-employment at the time of sampling (5.5 quarters with men and 6.5 quarters with women selected for a deeper analysis). This implies that the baseline hazard reflects the effect of a selection procedure taking place *before* rather than *during* the period of observation.

The duration of joblessness was measured with quarter dummies designating the time elapsed since the onset of non-employment. Those non-employed for more than 28 quarters, that is, who lost or left their job before 1990, and those who left school before 1990 but never worked, were treated as if they had been non-employed for 29 quarters and were dropped from the analysis after a first, exploratory stage of estimations. The detailed analysis refers to those who left employment after 1992 (see Appendix 1).

3.6. Explanatory variables: the regional level

The 'job offer arrival rate' was presumed to be dependent on demand conditions in the regions approximated with the registered unemployment rate of the respondent's labor office district.[9] With regard to proxies for the informal economy we used Mária Lackó's (1999) estimates based on

[8] To some extent this also applies to the earnings-related UI benefit, because a high proportion of the recipients are entitled to the minimum benefit (see Micklewright and Nagy 1995).

[9] Hungary has 169 labor office districts with an average population of 47,000 plus the Budapest district with 2 million inhabitants.

electricity consumption data.[10] The county-level panel estimations rely on a two-equation model. The first equation of the structural form is based on the assumption that total electricity consumption depends on regional GDP, the contribution of industry to GDP, the share of energy-intensive branches in industry, the use of alternative sources of energy and the size of the informal economy. The second equation tries to capture the benefit for workers and costs for employers of formal (registered) - as opposed to informal - transactions and the scope for evading registration. The size of the informal economy (a latent variable) is assumed to be negatively affected by net wages holding labor costs constant, positively affected by labor costs holding net wages constant, and influenced by the *per capita* number of registered sole proprietorships. By substituting the second equation with the first, Lackó comes to an estimable reduced form and predicts the size of the informal economy by means of the estimated coefficients using the second equation. We used her estimates for 1995 suggesting that 19-24% of the electrical energy was used in the informal economy in rural areas and 29% in Budapest.

Lackó (2000b) also provides estimates for the micro-regions. In this model household electricity consumption is regressed on household income levels, alternative sources of energy, and proxies of agricultural activities which generate informal job opportunities such as making wine and liquor. Several indicators taken from this model have been tested in this analysis but generated less satisfactory results than the county-level estimates.

The county-level estimates of the informal economy are strongly correlated with the size of the tertiary sector. This is measured with employment in trade in 1990 and related to Lackó's estimates in panel (a) of Figure A6 in the Appendix for figures. Since the tertiary sector is one of the major areas of informal employment the finding of a strong positive correlation can be interpreted as supporting evidence.

A critical interpretation would argue that the share of the hidden economy for region k (designated with h_k) is calculated in Lackó's model as:

$$(2) \qquad h_k = (aT_k+bW_k+cS_k)/E_k$$

where W stands for the employers' wage cost, T stands for wage-related taxes paid by employees, S stands for (lagged) self-employment, E denotes energy consumption, and the parameters a, b and c are taken from an equation where the impact of W, T and S on E had been controlled for GDP, degree of industrialization, composition of manufacturing, and the use of alternative energy sources. One can argue that of two regions with similar levels of GDP and industrialization the one with higher wages, more small businesses, and lower energy consumption will have a higher estimate of h_k irrespective of how many of the businesses are registered. If our understanding of the model is correct high values of h_k may hint at developed regions with economies biased for the tertiary sector and small businesses.

This conjecture is supported by the patterns of correlation between h_k, the size of the tertiary sector (S), and agriculture (A). Calculating county-level partial correlation coefficients, we obtain $r(h,S) = 0.71$ and $r(h,A)= –0.1$,which is not significant even at the 0.6 level.[11] Lackó's estimates are practically unaffected by the size of the agricultural sector although it is undoubtedly an important provider of unregistered jobs. The tertiary sector may, however, be even more important, justifiably dominating the estimates of the total hidden economy. Alternatively, h_k may be interpreted as a fine measure of the level attained by a region in the course of modern, post-industrial economic development.

We need, however, to find variables approximating the size of the informal economy in rural areas as this is apparently not reflected in Lackó's county-level estimates. Hungary's rural areas are cultivated by large capitalist enterprises (former Soviet-type cooperatives) and private farmers, and

[10] Lackó's model was primarily developed for cross-national comparison. Lackó (1998, 2000a) gives a detailed account of how the estimations proceed. The model and the results are extensively discussed in the March 2000 issue of the *Journal of Economic Literature*.

[11] S and A relate to employment in the given sector divided by the active population on the basis of the 1990 census.

the latter is probably a source of informal employment. The size of this sector was approximated with the ratio of the self-employed and their assisting family members to the total employed population. In order to rely on a sufficiently large number of observations this indicator was calculated by pooling eight waves of the LFS (1997:1–1998:4) and taking county-level means. The relation between the size of the total agricultural sector and this indicator is reported in panel (b) of Figure A5. There is a strong connection between the two variables but Bács and Csongrád counties have particularly high rates of self-employment. These regions indeed have labor-intensive agriculture (fruit, wine, greenhouse production), and a tradition of employing 'black' labor on a massive scale. By contrast, Hajdú or Szolnok, with similarly sized agricultural sectors dominated by large estates, have low rates of self-employment.[12]

3.7. Sample restrictions

In explaining how the informal economy is expected to affect job-flows and discussing the LFS-based panel samples the sequence will be reversed by estimating the effect of the proxies first and discussing their interpretation in the concluding section. The non-employed population as a whole is too heterogeneous to analyze using a single model. In order to detect the main differences between groups, outliers and a reasonably defined sample the hazard models of job-finding were estimated for the total sample (see Appendix Table A1), and then for those who had lost or left employment after 1989 and who were not in receipt of a pension (Table A2). The most important individual-level variables and county dummies were used.

The data suggest that prime-age workers in receipt of disability pensions, in particular retired men, are highly unlikely to return to employment.Given their close-to-zero exit rate and large share in the risk group we decided to exclude them from subsequent analysis.

Most of the variables depicting the respondent's household status, such as marital status, family size, or the labor-market status of the spouse, proved insignificant in almost all specifications and sub-samples and have been omitted from Tables A1 and A2. The number of children appeared to affect the women's transition-to-work rate and was chosen for closer inspection. Men living with their parents and/or studying part-time appeared to have below average transition rates in some specifications, whereas the opposite was true for women although the effects were generally not significant.

The receipt of UI had no measurable effect on job-finding in the various specifications and sub-samples tested (see also Tables A1 and A2). Omitting this variable had no impact on other parameters (including those capturing the baseline hazard) therefore was not used in subsequent estimations.

The estimated baseline hazard for men decreases until about the 15^{th} quarter of joblessness and is later untrended (Appendix Figure A2). In the case of women there is a temporary increase in the hazard after about three years of non-employment when women generally return to employment after the birth of a child. After this point the hazard appears to have no trend.

In view of these preliminary results the analysis of job-finding was limited to those who received no pension during the survey period and who were previously employed but had lost or left their job after 1992. Setting the latter limit is justified by the shape of the baseline hazard (see Figure 2) suggesting that a selection procedure is at work among the non-employed with less than four years of joblessness while in 'older' cohorts the exit rate is uniformly low.[13]

Instead of regional dummies the equations include region-level means of variables relevant for the choice between employment and continued non-employment. The registered unemployment rate was measured for the 170 micro-regions and was time-varying. Lackó's measure of the informal economy and the ratio of self-employment to total LFS-based employment were used to capture the size of the informal economy on the county level. We used dummies for Budapest and villages with less than 3,000 inhabitants. In the same way, dummies were used in some sub-samples to distinguish marked outliers such as Hajdú or Vas counties.

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[12] Note that this indicator is different from that used in Lackó's estimates (per capita registered sole-proprietorships). The county-level correlation between them was 0.105 in 1995.

[13] Models were also estimated for these cohorts but the results are only briefly mentioned.

3.8. Analyzing job-loss

A quarterly period of employment was supposed to be interrupted by exit to non-employment in cases where: (i) the respondent was observed as employed in t and non-employed in t+1; and (ii) the respondent was observed as employed in both t and t+1 but reported a period of employment lasting less than three months in t+1. Full-time students and workers reaching retirement age in 1998 were excluded from the analysis. Moves from employment to full-time education were treated as a drop-out from the survey. The analysis was limited to those reporting that they had a job at the time of sampling and giving the starting date of that job.

The termination of a period of employment was treated as an event always leading to non-employment, that is, cases when a period of employment was interrupted by a short period of joblessness where non-employment was just an inbetween station between two jobs, were not observed. One reason for doing so was that we lack information on the duration of joblessness for those leaving the risk group during the last period of observation. Generally, the later they left the less was known about their career making a classification by type of exit difficult or impossible.

Another way to distinguish between types of exit is to use information on the causes of job-loss or job-leaving. Unfortunately, the responses are difficult to interpret because of the number of partly overlapping options offered to respondents. Furthermore, 'voluntary job-leaving,' retirement, or moves to maternity benefits are often motivated by bad or deteriorating job prospects, and therefore these responses are not a reliable source for distinguishing between job-loss and voluntary job change. Finally, and most importantly, I thought there was no need for such a typology. If the rates of job termination are equal in regions A and B, but voluntary labor turnover is higher in A, it should appear in the transition-to-work equations covering the same period.

The explanatory variables in this model were age, level of education, legal status of worker (employee, self-employed, casual worker, etc.), usual worktime, industrial sector where normally employed, and the same regional variables as in the transition-to-work equations. The duration of the period of employment was measured in the same way. Periods of employment starting prior to 1990 were treated as 29 quarters long in 1997:1 and 31 quarters long in 1997:3 but were excluded after the first, exploratory stage. The models were estimated for those who lost their jobs after 1992.

4. Results

This section presents the results for individual variables such as age or education and the results of the job-loss model, before turning to the issues of regional turnover rates, job-search, benefit effects and the impact of the informal economy. The estimated coefficients, test statistics and sub-sample means of the variables are presented in Tables A5–A8 (job-finding) and A9–A12 (job-loss).

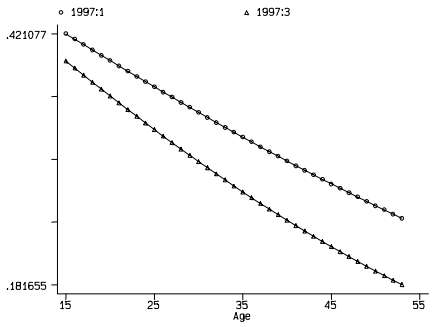
4.1. Individual differences in job-finding

Age. The effect of age on transition differs sharply by gender. Men's job-finding probability falls with age, and young and elderly women are less likely to return to employment than their middle-aged counterparts. The age-transition profiles for men and women and samples suggest that older men and younger women benefited most from the supply of seasonal job opportunities available to the risk group of 1997:1 but not to the 1997:3 cohort.[14]

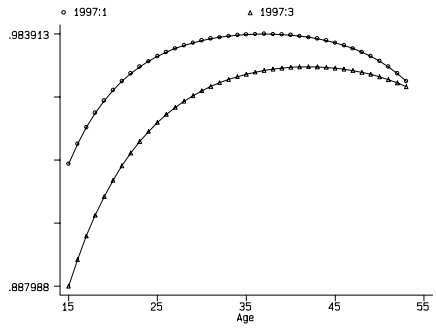
[14] The profiles are similar for men who lost or left their job prior to 1993; age effects are not significant for women.

Figure 1 Age-transition to job profiles

Men



Women



Excerpt from Tables A5–A8. Predicted at zero value of all other variables.

Education. The level of education has a marked effect on job-finding probabilities although its impact varies markedly with gender and season. Table 3 reports the estimated odds ratios taking completed primary school education as the reference category.

Table 3 Estimated odds ratios for job-finding probabilities

	1997:1	1997:3	1997:1	1997:3
	Men		Women	
Vocational	1.26	1.75***	1.53**	1.72***
Secondary	1.36*	1.71***	1.75***	2.35***
Higher	2.87**	2.25***	2.14**	3.34***

Excerpt from Tables A5–A8. Significant at the *) 0.1 **) 0.05 ***) 0.01 level

Note: Those with primary education have an odds ratio of 1 by definition. Hungarian vocational schools provide 3 years of education without 'maturity exam' unlike general secondary and vocational secondary schools.

Women with secondary school education have a greater advantage over primary school graduates than their male counterparts. This is consistent with the fact that women account for a high share in general and business-related education, as opposed to technical secondary education. The parameters suggest that those with only primary education men in particular, had less difficulty in finding a job in January–June than in July–December.

Family status. Persons living with their parents account for almost 25 per cent of non-employed men with previous job experience but only 5 per cent of women. Young men do not differ from other jobless persons in terms of their transition-to-work probability whereas young women are about twice as likely to find a job than to stay unemployed compared to other jobless women. As regards the number of children this has no effect in the case of men. Women with children were less likely to find employment in the 1997:1 sample but not in the 1997:3 sample, suggesting that seasonal job opportunities were typically taken up by women without children. The same is suggested by the parameter for the receipt of childcare benefit that has a negative, albeit insignificant, effect in the 1997:1 sample, and no effect in the 1997:3 sample.

The number of children and the receipt of childcare benefit are correlated and including both in the equations may bias their parameters. Dropping the number of children from the equations results in significant negative parameter for receipt of childcare benefit in the 1997:1 sample (0.63 significant at the 0.01 level), but not in the 1997:3 sample (0.88 significant at 0.51). By contrast, dropping receipt of childcare benefit has no effect on the parameters of the number of children. (Odds ratios of 0.813 versus 0.833 in the first sub-sample, and 1.044 versus 1.049 - both insignificant - in the second). Thus, we can conclude that it is the number of children, rather than the receipt of childcare benefit, that affects women's choice and/or 'employability.'[15]

[15] The same patterns and magnitudes apply to women who lost or left a job before 1993.

Baseline hazard. On the basis of the likelihood ratio tests we can reject the assumption of constant hazard in the samples analyzed. (This was not the case for those who lost or left their jobs prior to 1993). The baseline hazard decreased for men. In the case of women the hazard fell until t=10 after which it increased until about t=14 before falling again. At the given sample size the 95% confidence intervals are wide, making the evaluation of the estimates difficult. Difficulties are also caused by the relatively short duration of the follow-up in relation to the mean duration of periods of joblessness at the time of sampling.

4.2. Differences in job-loss

Age. The probability that a period of employment will terminate falls with age in the case of men and was estimated to be virtually unaffected by age in the case of women. Younger people had a slightly higher probability of losing their job in the 1997:3 sample but the differences across samples are not significant.

Education. The higher the level of education the lower the likelihood that a person will leave or loose their job. The relative risk of job-loss for men with only primary education is higher in the 1997:3 sample than in the 1997:1 risk group as shown by the odds ratios below. This was not the case for women.

Table 4 Estimated odds ratios for job-loss

	1997:1	1997:3	1997:1	1997:3
	Men		Women	
Vocational	0.827*	0.614	0.701	1.230*
Secondary	0.760*	0.699	0.577	0.864*
Higher	0.623*	0.416	0.518*	0.514*
Excerpt from Tables A9–A12. *) Significant only at the 0.1 level.				

Job status. Compared to employees, the members of co-operatives and partnerships, sole-proprietors and owners had a low likelihood of leaving or loosing employment. Casual workers employed in the 1997:3 sample had a high probability of becoming unemployed (unlike those in the 1997:1 sample). Part-timers and those reporting that their usual worktime is highly volatile or zero (in their main job) had an above average risk of job-loss (this refers to the usual weekly worktime which can differ from the actual worktime on the reference week).

Industry. The industry effects are weak. In the 1997:1 sub-samples none of the coefficients are significant for either men or women. In the 1997:3 sample for men only the public sector had a significant positive parameter, while in the sub-sample for women the agriculture and food sector appears to be a major cause of job-loss consistent with our expectations.

Time patterns. Tables A9–A12 present specifications including quarter dummies alongside the duration dummies. The coefficients suggest that those employed in January–March 1997 were likely to lose their jobs in the period July–September 1997. Additional evidence of seasonality emerges from Figure A5 which reports the baseline hazards re-estimated after dropping the quarter dummies. The hazards begin to fall not only from the fifth quarter of the job spell in the cohorts followed from 1997:1, but already from the first quarter in the samples of the 1997:3 sample. Generally, shorter periods of employment were more likely to terminate. The standard errors of the estimates are fairly large at the given sample size but the likelihood ratio tests rule out the assumption of constant hazard.

4.3. Regional turnover rates

The coefficients of the exploratory specifications presented in Tables A1–A4 (see Appendix-Tables) give us a preliminary overview of regional differentials. Men's probability of job-finding was above average in the low-employment counties of the North and the Northern Plain (with the

exception of Hajdú) in the 1997:1 sample (see Figure A4). In the case of women, a clear negative correlation can be observed between the employment ratio and the transition-to-work rate with the low-employment counties having the highest rates (Hajdú and Vas being heavy outliers).

In the 1997:3 sample for men the estimates for Szabolcs, Borsod and Szolnok fell close to the national average. Nódrád and Heves continued to have high re-employment rates and Hajdú was again an outlier with extremely low job-finding rates. As regards women, the negative correlation between the employment ratio and job-finding became weaker, and in the 1997:3 sample the low-employment counties of the North and the Northern Plain (with the exception of Hajdú) still had above average exit rates. Once again, Vas deviated from the 'mainstream' by having an exceptionally high rate of job-finding.[16]

Job-finding and job-loss rates were closely correlated in the 1997:1 sample (see Figure 2). Low-employment counties generally had high flows between employment and non-employment with the notable exception of Hajdú. In the 1997:3 sample the positive connection between job-loss and job-finding became weaker in the male sub-sample and virtually disappeared in the female sub-sample. The counties of the North (Nógrád, Heves and Borsod) continued to have high job-loss rates while their job-finding rates were also close to, or above, the national average. By contrast, the counties of the Northern Plain (Szabolcs, Szolnok and Hajdú) had high job-loss rates combined with low or average rates of job-finding.

The first results, although crude, thus challenge the general belief that the non-employed risk group in the depressed regions should be considered a 'stagnant pool' with very low turnover for either demand-side or supply-side reasons.

In addition to the rate of unemployment, which is positively correlated with transition-to-work in our samples but expected to have a negative causal effect on job-finding in any reasonable model of the labor market, the results also highlight the fact other region-specific factors are at work. Specifications of the job-finding equation using only the unemployment rate and a Budapest dummy to capture the region effects would yield significant positive (nonsense) parameters for the unemployment rate. In the specifications of Tables A5–A8 the local registered unemployment rate has a negative impact on job-finding probabilities although the parameters are not significant in three out of four cases. Similarly, we obtained significant negative coefficients for the Budapest dummy in the pilot stage which changed to positive - as expected - in the specification finally chosen.[17]

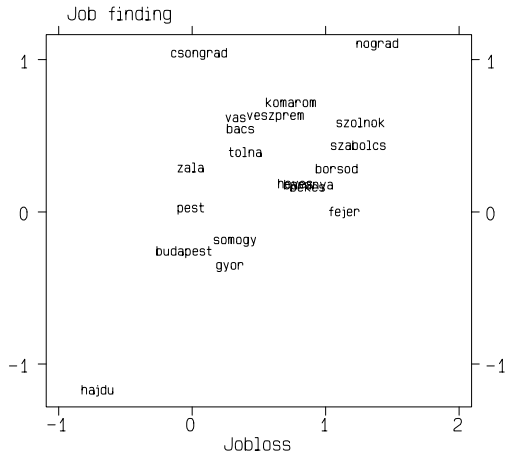
The forces implying average or above average turnover rates in most of the low-employment counties may be different in the Northern Plain, where one can observe marked signs of seasonality, as opposed to the North where mobility appears to be continuously above average.

[16] Note that the coefficients of the county dummies in Tables A1 and A2 are often insignificantly different from the base category (Pest). This is not surprising, however, given the small number of transitions. The impressions from these first results will be reinforced, however, by the evidence presented later.

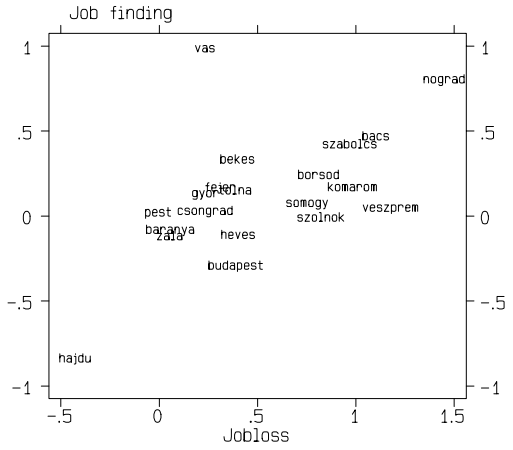
[17] The job-loss equations suggest that micro-regions with high unemployment rates lost more male jobs in both periods but that the effects were weak for women. The results are consistent with the observation of slightly growing regional differentials in terms of registered unemployment after 1996.

Figure 2 Regional (county-level) differentials in job-finding and job-loss (estimates from Tables A1 and A3)

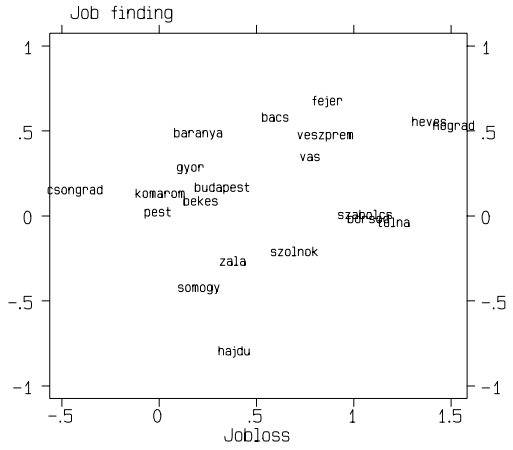
Men, 1997:1



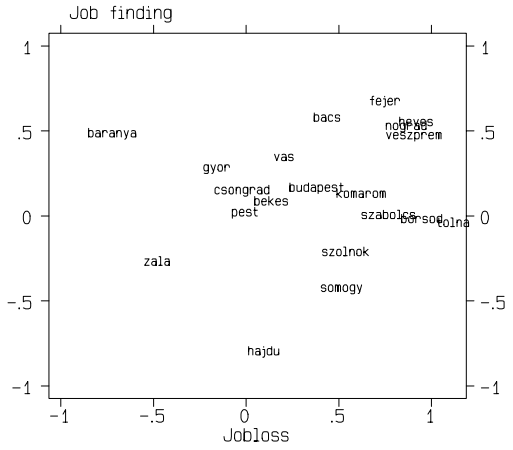
Women, 1997:1



Men, 1997:3



Women, 1997:3



4.4. The impact of job-search

Micklewright and Nagy (1999) found no difference between the job-finding probabilities of men 'actively searching for work' and those 'just wanting a job' but did for women. Our results are similar in finding no return to search activity for men, and a closer examination of the interrelation of job-search activity, labor-market conditions and transition rates suggests there is little, if any, return to job-search in the case of women.

Table 5 summarizes the estimated odds ratios for men and women reporting that they wanted a job whilst not actively searching for one, and those reporting 'job-search activity' during the week preceding the LFS interview. The two groups are divided into two sub-groups depending on the local unemployment rate. ('High' stands for rates over 11% of the national mean.) Those who reported that they did not want to work were treated as the base category irrespective of place of residence. In this category 5% of the periods resulted in transition in the 1997:1 sample (6% for 1997:3), with minor differences across regions.

Obvious caveats apply when using these variables to study transition-to-work because the replies given by respondents relate to a particular point in time, whereas job-finding may occur two or three months later during which time a person may change their mind or their environment may alter. Nevertheless, what we do is not so different from what statistical offices and governments do when

they distinguish between the unemployed and the inactive on the assumption that this categorization is socially meaningful and economically useful (in that it helps to predict what part of the non-employed population have strong ties to the labor market and what part have chosen not to participate in the labor force).

Table 5 Odds ratios for men and women 'wanting a job' and those 'actively searching for work'

	1997:1	1997:3	1997:1	1997:3
	Men		Women	
Wants a job without searching				
∗ Low unemployment	1.59	2.01	1.96	2.61
∗ High unemployment	1.70	0.98	1.85	1.90
Searching				
∗ Low unemployment	1.14	1.52	3.06	3.63
∗ High unemployment	1.92	1.51	1.57	1.83
Wants a job*	1.59	1.50	1.98	2.35
Searching*	1.46	1.54	2.39	2.96
Excerpt from Tables A5-A8. *) Same model as in Tables A5-A8 but no interaction between search variables and unemployment				

The last two rows of Table 5 report the results for a specification like that used by Micklewright and Nagy (1999) with similar results. In other words, there is no difference between men 'searching actively for work' and those who 'just want a job' but women actively seeking work have a higher transition probability. In this sample the odds ratios for 'unemployed' and the 'inactive' women (2.39 versus 1.98 and 2.96 versus 2.35) can be regarded as different at 0.32 and 0.25 levels of signiificance.

The results broken down by region provide us with further interesting details. In the 1997:1 sample those 'just wanting a job' had similar probabilities of transition across genders and regions (odds ratios of about 1.6–1.9). Job-search did not improve the odds ratios, with the exception of women searching in low-unemployment regions (3.06 versus 1.96). Male job-seekers in low-unemployment regions had an even lower risk of transition than non-searchers.

In the 1997:3 sample those 'just wanting a job' in 'bad' regions had a lower probability of transition than men and women in 'good' regions (0.98 versus 2.01 and 1.90 versus 2.61). Job-search activity brought job-seekers in 'bad' regions either no, or only minor, improvement in the transition probability. (In the case of men the odds ratios of 0.98 and 1.5 are significantly different at the 0.105 level.) The case was similar for men living in low-unemployment areas: here again we obtain lower estimates of the transition probability for the 'unemployed' than for the 'inactive.'

Women actively searching for jobs in 'good' regions had an odds ratio of 3.63, whereas those 'just wanting a job' in the same regions also had a high ratio of 2.61 – an estimate that can be regarded as lower than 3.63 only at the 0.2 level of significance. Women actively searching in 'good' regions had markedly higher job-finding probabilities than those actively searching in 'bad' regions but their relative risk of transition-to-job was lower compared to the 'inactive' women of their own regions.

These results cast further doubts on the distinction made in the LFS between 'unemployment' and 'inactivity' and reinforce the supposition that something is wrong with the categorization of non-employed men. Most probably, the questionnaire ignores some ways of collecting information about the labor market. For instance, job-seekers, especially those living in small villages or socially 'dense' urban ghettos, do not need to repeatedly 'ask friends and relatives' or 'contact employers' in order to obtain information about job offers as their need for work, once expressed, will not be forgotten. It is also likely that the number of people expecting 'recall' is underestimated in the survey because it tends to ignore the cases of regular calls for casual work in construction and so forth, and other work opportunities not involving a formal employment contract.

4.5. The informal economy

In rural areas with high ratios of self-employment transition probabilities were higher in the spring when most of the transitions from the 1997:1 non-employed risk group took place. The estimated transition-to-work probability at 6 quarters of duration for a 30-year-old man looking for a job outside Budapest (setting the local unemployment rate at 15% and taking other variables into consideration at their mean or default value) was 8.7% at the minimum of the regional self-employment ratio but 14.5% at its maximum. During the autumn and winter (typical times of exit from the 1997:3 risk group) no significant effect was detected.

Counties with high ratios of self-employment did not have particularly high job-loss rates in either of the two samples. The estimated coefficients for this variable were negative but insignificant in the 1997:3 samples. However, those living in villages employed in 1997:3 had a high probability of job-loss unlike the villagers observed in the 1997:1 cohort.

The coefficients for Lackó's estimates of the informal economy were significant in all but one specification and sub-sample suggesting lower transition rates in regions with a larger hidden economy. The effect was somewhat stronger in the 1997:3 sample contradicting the result obtained for our proxy of the informal agricultural economy.

Table 6 The impact of the informal economy on transition to work (odds ratios)

	1997:1	**1997:3**	**1997:1**	**1997:3**
	Men		**Women**	
Informal economy	0.911*	0.878	0.826	0.804
Excerpt from Tables A5–A8. *) Significant only at the 0.1 level				

At this stage it would be premature to draw conclusions from these coefficients about the 'disincentive effect' of the informal economy but we should bear in mind that the estimated effect, irrespective of what this means, is strong. A 30-year-old women actively looking for a job in a high-unemployment labor office district (1997:3 sample, 6 quarters of joblessness, 15% rate of unemployment and mean/default value of other variables) had an 8.1% risk of exit at 22% share of the informal economy, but only 5.4% in a county with a share of 20%.

The proxy of the hidden economy is also strongly and negatively correlated with the probability of job-loss, with no difference across gender and cohorts (see Table 7). The finding that regions with a high share of the informal economy have low turnover, that is, low mobility between employment and non-employment, is perplexing at first sight and calls for detailed examination.

Table 7 The impact of the informal economy on job-loss (odds ratios)

	1997:1	**1997:3**	**1997:1**	**1997:3**
	Men		**Women**	
Informal economy	0.833	0.839	0.808	0.874
Excerpt from Tables A9–A12				

By 'informal' we mean employment relationships not reported to the tax authorities. The question of how these transactions appear in the LFS data is an open one and, without having at least a hypothetical answer, we are unable to interpret the estimation results. We have instead tried to find an answer by starting from two extreme scenarios.

Suppose that workers are distributed between formal employment (E), informal employment (I), and non-employment (N). If it is generally the case that workers report their informal jobs (case a), then researchers dealing with LFS data are likely to find them in the sample of employed workers. If they do not report their informal jobs (case b), they will be observed in the non-employed sample. The distribution of workers by their actual true status and those based on LFS data in the two regimes

is shown in Table 8 where the shaded areas indicate the composition of the ‘employed’ and ‘non-employed’ samples drawn from an LFS wave.

Table 8 The distribution of respondents by labor-market status

	LFS observation	
Actual	(a)	(b)
E	E	E
I	E	N
N	N	N

Before exploring the practical implications of this peculiar situation we need to make some assumptions about job stability in the informal sector in general. Demand-side factors suggest both stability and instability. On the one hand, employers share the gain from tax evasion with their employees which encourages them to maintain informal jobs as long as possible. On the other hand, firms offering informal jobs tend to be more vulnerable insofar as their activities are often seasonal and heavily exposed to the pressures of competition, jobs are not protected by law, and so forth. The behavior of the supply side is also difficult to predict. On the one hand, workers’ interest in maintaining informal, as opposed to formal, jobs may be weaker because they do not generate entitlement for pensions and social security and because career prospects are poor. On the other hand, employees are keen to maintain their jobs since they share the benefits from tax evasion with their employers and may also collect welfare benefits on the grounds of being unemployed. Depending on the strength of these effects higher values of I/(I+E) may affect the survival rate of informal jobs positively, negatively, or not at all. At the same time, the continual ‘closing down’ and ‘opening up’ of jobs in the informal sector is likely to increase the transition rate of the ‘genuinely’ non-employed.

On the basis of the LFS data, what do we see when examining how flows are related to the regional share of the informal economy in regime (a) when workers tell the truth? The effect on job-loss will be indeterminate for the reasons mentioned above. The non-employed risk group now consists of the ‘genuinely’ non-employed. A higher share of the informal economy may have a positive or negative impact on their job-finding probabilities depending on job turnover in the informal sector. In case (a) when workers report their informal jobs to the LFS interviewers we find ourselves in an awkward situation and since we do not know what to expect we cannot interpret the correlations between I/(I+E) and the intensity of labor-market flows.

In case (b) when respondents do not report their informal jobs, the unregistered are observed in the non-employed risk group. Cases when workers shift between non-employment and informal employment remain unobserved in the LFS. This means that a large part of the mobility stream stemming from high job turnover in the informal sector will not be reflected in the data. By contrast, the willingness of informal sector workers to remain ostensibly non-employed, cheat on taxes, and collect benefits will have an impact on the observed job-finding probabilities. We can therefore expect that the share of the informal economy will have a negative effect on the observed job-finding ratio in the LFS-based panel estimates. In scenario (b) the employed risk group is composed of workers in the formal sector. As their job-loss rate is unlikely to be affected by a higher share of informal job-holders in the (alleged) non-employed risk group we can expect a zero correlation between the observed job-loss rates and the share of the informal economy.

In case (b) a negative impact of the informal economy on job-loss should be interpreted as a kind of accidental correlation. Regions with only a low share of the informal economy may have high job-loss rates because their economies are still in the stage of post-communist restructuring (which accounts for the absence of a well developed informal sector), and some may have a high share of seasonal activities. Regions with a high share of the informal economy may have low job-loss rates because their economies are well-functioning. Their developed tertiary and small-business sectors may have simultaneously helped them survive the transformational recession, respond to the challenges of transition, and develop a large non-agricultural hidden economy.

The apparent correlation between the rates of job-loss and job-finding may generate biased estimates for job-finding. If at least a part of the job-losers leave vacancies behind, then higher rates

of job-loss imply higher rates of job-finding *per se*, and regions with a high share of the informal economy (and low job-loss rates) may have a low job-finding rate for that reason.

Thus, we come closer to measuring the disincentive effect of the informal economy, assuming that case (b) applies to the LFS, by including the estimated region-specific differentials in job-loss rates in the estimation of job-finding probabilities. At this point we are close to the limits allowed by the data because having one more region-specific variable in the estimation again increases the risk of unstable and biased estimates due to multicollinearity. Furthermore, importing results from one model to another without importing the estimation errors is a debatable operation. Taking into account these risks and shortcomings we re-estimate the models of Table A5–A8 by including the regional parameters of the respective job-loss equations from Table A3. Unimportant variables and interaction effects are dropped.

The parameters reported in Table A13 have the expected sign and we obtain positive coefficients for both the contemporaneous and lagged county-specific job-loss rates. In all but one case the parameters of this variable are significant. The adverse effect of the informal economy proxy on job-finding becomes weaker and is significant at the 0.05 level in only one of the six equations. The results thus reveal little evidence of disincentives due to the presence of an informal economy.

4.6. Benefit receipt

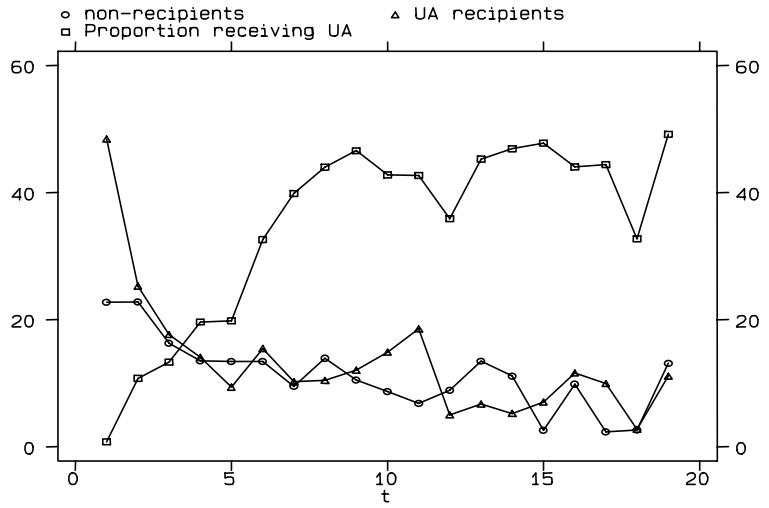
The fact that transition rates for both men and women are unaffected by the receipt of UI does not exclude the possibility of a disincentive effect given that we measure benefit receipt with a single dummy variable and cannot properly control for other determinants of the transition probability. The finding is, nevertheless, consistent with the more detailed results reported by Galasi (1994), and Micklewright and Nagy (1994, 1995) suggesting no marked disincentives due to UI receipt in Hungary.

Men observed as UA recipients differ from the rest of the non-employed population in terms of job-finding probabilities. This observation remains valid if we restrict the estimation to those with a low level of education and a high probability of UA receipt, if we estimate the sample separately for low-unemployment and high-unemployment regions, or if we 'interact' the UA variable with unemployment or other regional variables. Indeed, this holds true even if we examine the raw data, that is, if we let the UA variable absorb a series of factors negatively affecting the transition probability of the typical UA recipient (low educational level, longer duration of joblessness, unfavorable local labor-market conditions). In Figure 3 the quarterly periods observed in the follow-up of the 1997:1 stock are ordered by duration (t), and the rates of transition are shown in the groups of UA recipients and non-recipients. Apart from t=1 the transition rates are practically the same. The results are similar for the 1997:3 sample.

In the case of women we obtained parameters for UA receipt of 0.673 significant at the 0.087 level (1997:1 sample), and 0.829 significant at the 0.791 level (1997:3 sample). We are tempted to regard it as an indication of a stronger response to seasonal job offers among the non-recipients rather than as evidence of disincentives. Interactions of UA receipt and regional variables (such as unemployment correlated with wages) were not significant although we would expect a stronger disincentive effect for flat-rate UA in the high-unemployment, low-wage regions.

Since benefits increase a person's income while non-employed the finding of no effect on the duration of joblessness may reflect a specification error. Alternatively, it may indicate that a person's income while non-employed is strongly affected by non-benefit forms of income. Results from on-going research using data from the Household Budget Survey (HBS) yield some preliminary supporting evidence for the latter interpretation.

Figure 3: The rate of job-finding among UA recipients and non-recipients (men, periods observed in the follow-up of the 1997:1 risk group)

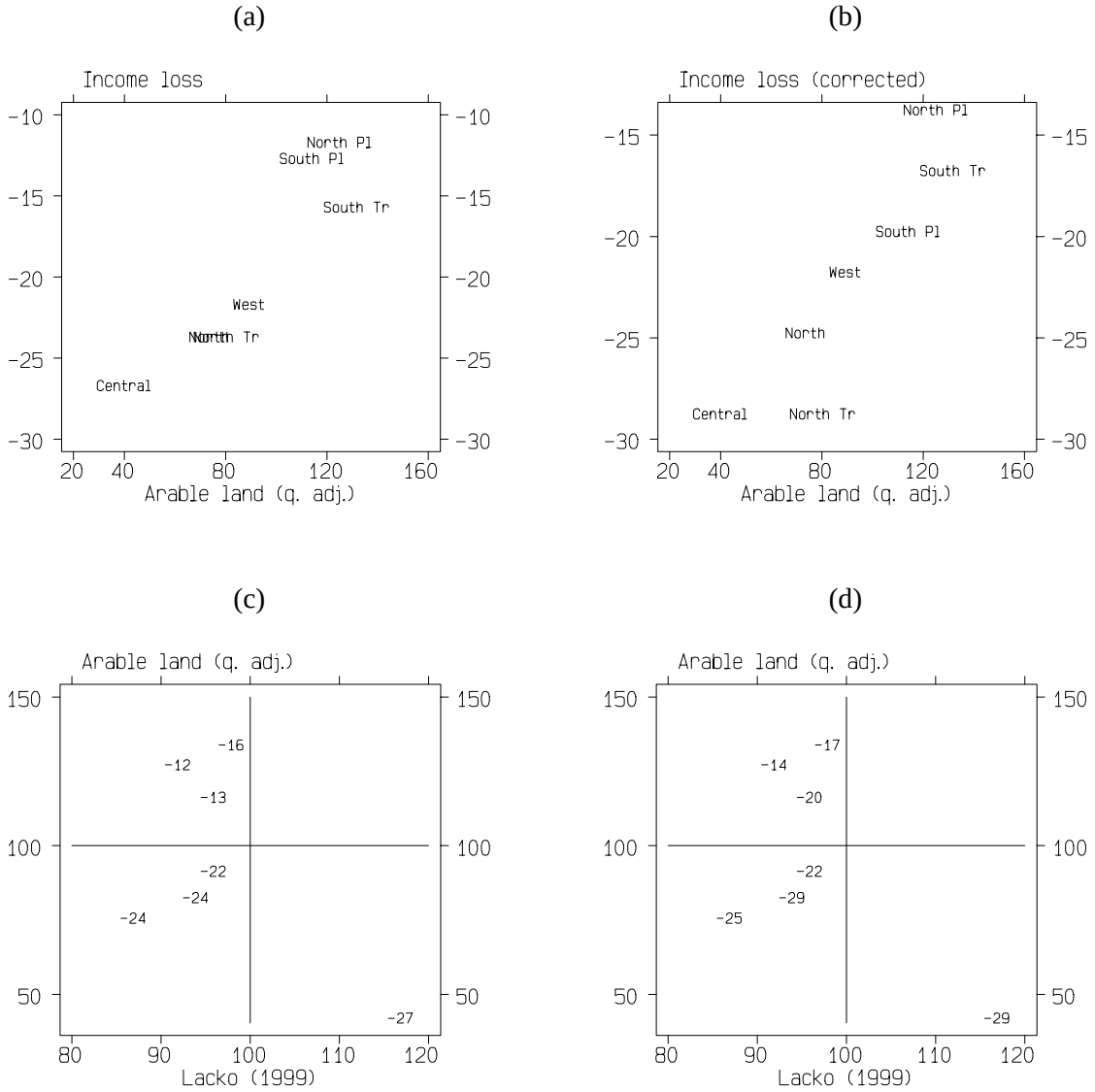


The calculations presented in Appendix 2 refer to a pooled sample of households observed in consecutive annual waves of the HBS between 1993 and 1998. Changes in real per capita income for households losing a single wage-earner is compared across regions. On average these households lost 25% of their income which dropped to 18% in the case of a job-loser receiving benefit (either UI or UA)%.

Compared to this difference the regional differentials are large, widely dispersed over a range of 15 percentage points, and are systematic. In agricultural regions where high-quality arable land is widely available, the income loss suffered by households is less severe. This is shown in panels (a) and (b) of Figure 4 plotting regions by quality-adjusted arable land per capita and income loss as estimated in Appendix 2.[18] Panels (c) and (d) give the estimated income loss by availability of fertile land and Lackó's estimate of the hidden economy. In the South Plain and the North Plain income losses are estimated to be around 15% and about 20% in the Southern Trans-Danubian area. In the Northern, Western and Northern Trans-Danubian regions they drop to the 22–29% range, and are close to 30% in the Central region. There are marked differences between regions with similar levels of Lackó's estimates depending on the availability of fertile land.

[18] The former indicator was calculated as a weighted macro region-level average of arable land per capita using micro-region level observations on the quantity and quality of land and weighting with the so-called 'golden crown value' of the soil. The data were taken from the CSO's TSTAR database.

Figure 4: Proxies of income loss from job-loss, availability of fertile land and informal economy



(a) Real income loss from job-loss estimated from the HBS (Appendix 2) versus quality-adjusted arable land *per capita*.

(b) Real income loss from job-loss, controlled for income change in reference households, as estimated from the HBS (Appendix 2) versus quality-adjusted arable land *per capita*.

(c) Quality-adjusted arable land *per capita*, Lackó's (1999) estimate of the informal economy and region-specific real income loss from job-loss as estimated from the HBS (Appendix 2).

(d) Quality-adjusted arable land *per capita*, Lackó's (1999) estimate of the informal economy and region-specific real income loss from job-loss (controlled for income change in reference households) as estimated from the HBS (Appendix 2).
Note: The proxies of land and informal economy are expressed as a percentage of the national mean.

The calculations presented here, although preliminary, support the conjecture that farming and/or the local economies organized around farming can substantially raise the income of the non-employed. This effect may dominate the effect of benefits on reservation wages.

4.7. Implications for the undeveloped regions

In the case of Northern Hungary we found both the job-loss rates and the job-finding rates to be consistently high over time. Understanding why the job-loss rate is above average leads us to the demand side of the market. The available results do not suggest any significant regional differences in the behavior of continuously operating businesses. Testing several specifications of the standard labor demand model Kőrösi (1999) found employment-to-output and employment-to-wage elasticities to be similar in the North and other regions in 1992–1997.[19] The reason why the 'mortality rate' of jobs is relatively high may instead be connected with the prolonged process of 'transition' in this region characterized by a combination of heavy industry and low-income agriculture. It is true, however, that the turnover rate in the North became relatively high after 1996 (see Figure A7). While the rates of flows between employment and non-employment generally declined in Hungary after 1992, they remained close to their previous levels in the North (see last row of Figure A7).

The high job transition rates of workers in the North may be explained by the high rate of job-loss characteristic of the prolonged restructuring process. On the other hand, evidence presented earlier suggested that people return to employment rapidly because their income while non-employed is relatively low. The data suggests that workers in the North have huge income losses from job-loss, similar to those estimated for the developed Western and Northern Trans-Danubian areas and almost twice as high as those in the Northern Plain.

We should stress that the majority of the non-employed in the North live in rural areas, that is, in micro-regions with a population of less than 50,000. Their share of total non-employment was 67% in 1997:1 for instance, circa 9% above the national average and only 3% below average for the Northern Plain. Thus, the difference between the North and the Northern Plain is not tightly linked to the 'urban-rural' or the 'industrial-agricultural' divide. Although some of the industrial centers in the area are themselves depressed (Ózd and Kazincbarcika in particular), the rural areas bear most of the burden of the crisis. The worst affected micro-regions are those with no large urban centers and where the quality of land is poor as in the Cserehát area where several villages (Szemere, Csenyéte, Rakaca, Pamlény) had unemployment rates of over 90% in 1993 and there is no reason to believe that this figure is much lower now. The reason why it is difficult for families to compensate the loss of a wage earner in these districts may be related to the scarcity of fertile land, the lack of a viable local economy organized around farming, and the absence of a developed, partly informal tertiary sector.

The data tell a different story about the Northern Plain which appears as a typical case of an undeveloped, low-employment rural region. We found average or lower than average exit rates during the autumn and winter but seasonal effects kept the mobility of workers between labor-market states high during the spring and summer (with the exception of Hajdú county). Although a high proportion of the non-employed report a willingness to work, their job-search intensity is low, presumably because households are able to compensate the loss of a wage earner better here than anywhere else in the country.

We conclude that the key for the diagnosis and treatment of high unemployment in the North should be sought on the demand side of the labor market, whereas understanding the low employment level of the Northern Plain requires research into the nature of the rural economy and the ways in which households combat the detrimental impact of job-loss and seasonality.

5. Summary, Conclusions and Policy Implications

In examining the characteristics of non-employment in Hungary's two depressed macro-regions using data from surveys such as the LFS and the HBS, and considering the appropriateness of the radical government reforms we found no outstanding evidence to support these reforms and instead have reason to be concerned about their implications for the poorest regions.

In the first place, the findings call into question the utility of 'abolishing' the registered unemployment rate or other alternative indicators of joblessness and support the conclusion, first drawn by Micklewright and Nagy (1999), that relying on the ILO-OECD measure of unemployment as the single measure of joblessness is misleading, particularly so in the case of the male labor market.

[19] Kőrösi also estimated these models for counties with a high turnover such as Nódrád, Heves, Szabolcs and Borsod versus other regions with similar results.

Secondly, the LFS data do not support the assumption that transition-to-work probabilities are strongly affected by benefit receipt. Workers not receiving benefits have about the same transition-to-work rate as those in receipt of benefits, all other things being equal. The results do not rule out that the Hungarian benefit system may increase the rate of unemployment indirectly insofar as high benefit rates may imply high levels of inactivity among workers with a low level of training, especially in rural areas, irrespective of whether they receive benefits. By increasing the effective minimum wage (Boeri 1999) high benefit levels may select out low-qualified workers from urban labor markets by encouraging them to remain passively, or to take up residence, where their alternative incomes are relatively high, that is, in rural areas where conditions favor subsistence farming and work in the informal local economy. Moreover, we found weak evidence of lower exit-to-job rates in regions where the informal economy has a higher share according to the first best available estimates of the hidden economy by Lackó (1999). Since these estimates indicate a higher share of the hidden economy in developed regions this effect, supposing that it really exists, tends to narrow the gap between regions, but does not explain the dramatically low employment levels of the North and the Northern Plain.

Preliminary findings based on the HBS data suggest that households in regions with high-quality agricultural land are more successful in compensating the loss of a household wage-earner. The resulting impact on reservation wages is part of the problem at the Northern Plain but not in the North.

Finally, the findings suggest that the extremely high non-employment rates of Hungary's depressed regions cannot be accounted for exclusively or even predominantly, by low exit-to-job rates. Indeed, workers in the North have one of the highest exit-to-job rates in the country, and the Northern Plain had average job-finding rates for spring and summer 1997 and not significantly below average in the second part of that year, except for Hajdú where mobility was far below the average for the period examined. Both the North and the Northern Plain had relatively high job-loss rates in 1997–1998. Generally speaking, the 'stagnant pool' characterization of unemployment does not apply in these regions insofar as they are in low-employment areas combined with continuously (North), or seasonally (Northern Plain), high mobility.

Attempts to cure this type of high unemployment by cutting back on benefits, introducing 'workfare,' (policies strongly prefering public works to cash benefits) and crusading against the informal economy appears to be not only useless, insofar as the problem is often rooted in the demand side of the market, but also counterproductive in terms of workers' welfare, especially in the North where alternative sources of income are probably low, whilst their propensity to work and job-search activity is high. Shifting the burden of income replacement to the seasonal rural economy in the Northern Plain may well be a valid option but can hardly be regarded as the primary task of employment policies. Without the creation of steady, stable, non-seasonal jobs in the near future this region may find itself locked into the status of the 'poor rural periphery' with little hope of integrating into the European economy.

The analysis provides some lessons for future research. In the first place it calls for a more cautious use of statistics derived from the Hungarian LFS given its classification of workers by labor-market status. Secondly, the non-trivial differences between results from the 1997:1 and 1997:3 risk groups highlight the risks of research based on a single sample. And finally, the paper points out that regional differences in job-finding rates are difficult to interpret without accurate information on job-loss rates.

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Appendix – Tables

Table A1
Job-finding (total sample)
Discrete time duration model (logit), odds ratios, baseline hazard shown separately

	Men		Women	
	1997:1	1997:3	1997:1	1997:3
Age	0.974 ***	.9627 ***	1.183 ***	0.969
Age squared	..	..	0.998 ***	1.000
Education: vocational	1.115	1.962 ***	1.494 ***	1.633 ***
Secondary	1.177	2.214 ***	1.621 ***	2.403 ***
Higher	2.167 **	1.896 **	1.883 ***	4.451 ***
family status: child	0.795 *	1.007	1.539 *	1.069
Part-time education	0.628	0.436 ***	1.503	1.518 **
Wants a job without searching	1.871 ***	1.254 *	1.812 ***	1.565 ***
Searching for a job	1.739 ***	1.598 ***	2.626 ***	2.837 ***
Receives pension	0.074 ***	0.153 ***	0.233 ***	0.164 ***
Receives childcare benefit	..	..	0.740 **	0.608 ***
Receives UI	1.208	1.111	0.986	0.970
Receives UA	1.071	1.201	0.647 **	0.711 *
Szabolcs	1.506 **	0.983	1.491 *	1.254
Borsod	1.291	0.960	1.246	1.332
Nógrád	2.945 ***	1.661 *	2.186 ***	2.071 **
Szolnok	1.749 **	0.791	0.970	1.437
Hajdú	0.301 ***	0.440 ***	0.423 **	.0676
Heves	1.170	1.699 **	0.875	2.068 ***
Békés	1.144	1.065	1.364	1.090
Tolna	1.439	0.939	1.137	1.077
Baranya	1.163	1.590 *	0.901	0.762
Somogy	0.810	0.641	1.056	0.517 *
Komárom	1.996 **	1.113	1.159	1.638 *
Bács	1.679 **	1.744 **	1.563 **	1.854 ***
Fejér	0.974	1.922 ***	1.157	1.270
Veszprém	1.830 **	1.573	1.029	1.434
Csongrád	2.767 ***	1.138	1.009	0.685
Zala	1.301	0.748	0.869	0.827
Gyõr	0.685	1.299	1.117	1.174
Budapest	0.751	1.154	0.731	0.933
Vas	1.809 *	1.383	2.625 **	2.637 ***
Number of observations	9,580	9,091	12,129	11,168
Pseudo-R2	0.2148	0.1926	0.1232	0.1387
Likelihood ratio test for time dummies	94.37 ***	66.15 ***	102.3 ***	85.67
Constant of the log form	-1.164	-1.774	-5.690	-2.950

Significant at the ***0.01 **0.05 *0.1 level. References are: primary school, employee, weekly worktime >40 hours, manufacturing industry, Pest county. Counties ordered by employment ratio at 1997:1 (from lowest to highest).

Table A2

Job-finding

(Workers who lost or left their job after 1989, not receiving pension)

Discrete time duration model (logit), odds ratios, baseline hazard shown separately

	Men		Women	
	1997:1	1997:3	1997:1	1997:3
Age	0.975 ***	0.966 ***	1.177 ***	1.113 *
Age squared	..	..	0.998 ***	0.998 **
Education: vocational	1.160	1.699 ***	1.611 ***	1.667 ***
Secondary	1.249	1.681 ***	1.732 ***	2.239 ***
Higher	2.247 **	2.035 *	1.960 ***	3.675 ***
family status: child	0.834	1.007	1.537 *	1.108
Part-time education	0.263 *	0.543	1.173	1.255
Wants a job without searching	1.531 **	1.223	1.871 ***	1.641 ***
Searching for a job	1.424 **	1.339 **	2.518 ***	2.569 ***
Receives childcare benefit	..	..	0.705 **	0.813
Receives UI	1.221	1.079	1.018	0.969
Receives UA	1.055	1.228	0.633 **	0.816
Szabolcs	1.368	0.801	1.549 *	1.307
Borsod	1.210	0.920	1.361	1.291
Nógrád	2.861 ***	1.547	2.034 **	2.006 *
Szolnok	1.574	0.711	1.144	1.730 *
Hajdú	0.291 ***	0.413 ***	0.476 ***	0.849
Heves	1.156	1.111	0.824	2.159 ***
Békés	1.059	0.889	1.485	1.125
Tolna	1.542	0.720	1.351	1.276
Baranya	1.039	1.066	0.840	0.712
Somogy	0.775	0.322 **	1.096	0.615
Komárom	1.849 *	0.976	1.120	2.124 **
Bács	1.589 *	1.440	1.400	1.902 **
Fejér	0.968	0.949	0.959	0.780
Veszprém	1.950 **	1.376	1.135	1.326
Csongrád	2.357 ***	0.985	1.173	0.679
Zala	1.481	0.817	0.794	0.862
Gyõr	0.689	1.148	1.139	1.336
Budapest	0.690	1.173	0.725	1.095
Vas	1.908 *	0.758	3.602 ***	2.782 ***
Number of observations	4,150	3,169	6,138	5,074
Pseudo-R2	0.0750	0.0701	0.0785	0.0836
Likelihood ratio test for time dummies	81.94 ***	53.69 ***	64.75 ***	74.83 ***
Constant of the log functional form	-0.9930	-1.037	-5.744	-5.089

Significant at the ***0.01 **0.05 *0.1 level. References are: primary school, employee, weekly worktime >40 hours, manufacturing industry, Pest county. Counties ordered by employment ratio at 1997:1 (from lowest to highest).

Table A3

Job-loss (all workers)

Discrete time duration model (logit), odds ratios, baseline hazard shown separately

	Men		Women	
	1997:1	1997:3	1997:1	1997:3
Age	0.866 ***	0.919 **	0.995	0.959
Age squared	1.002 ***	1.001 **	0.999	1.000
Education: vocational	0.749 ***	0.601 ***	0.856	1.001
Secondary	0.598 ***	0.539 **	0.634 ***	0.787 *
Higher	0.392 ***	0.303 ***	0.674 ***	0.420 ***
Was unemployed before	1.375 ***	1.510 ***	1.105	1.576 ***
Member of partnership or coop	0.606 ***	1.107	1.064	0.813
Sole-proprietor	0.410 ***	0.705 *	0.675 ***	0.872
Employer	0.162 ***	0.344 **	0.938	0.543
Casual worker	2.082 ***	2.504 ***	2.056 ***	1.441
Assisting family member	0.306 ***	0.933	0.927	1.214
Usual worktime: Variable	1.718 ***	1.503 **	1.250	2.156
Zero	5.311 ***	2.721 ***	13.76 ***	5.675 ***
Less than 40 hours	1.876 **	1.942 *	1.472 ***	2.334 ***
Agriculture and food	1.263	1.303 *	1.460 ***	2.281 ***
Construction	1.134	1.191	1.326	0.747
Trade, hotels and restaurants	1.327 ***	1.332 *	1.153	1.210
Other non-public	0.922	0.777	1.030	0.755
Public sector	1.208 *	1.793 ***	0.905	0.773
Szabolcs	3.505 ***	2.901 ***	2.654 ***	2.170 ***
Borsod	2.981 ***	2.950 ***	2.261 ***	2.596 ***
Nógrád	4.043 ***	4.577 ***	4.283 ***	2.388 ***
Szolnok	3.562 ***	2.017 ***	2.290 ***	1.721 *
Hajdú	0.497 **	1.480	0.656	1.105
Heves	2.185 ***	4.035 ***	1.501	2.518 ***
Békés	2.399 ***	1.246	1.497	1.151
Tolna	1.502	3.357 ***	1.480	3.074 ***
Baranya	2.413 ***	1.230	1.063	0.487 *
Somogy	1.392	1.235	2.135 ***	1.685 *
Komárom	2.118 **	1.012	2.686 ***	1.873 *
Bács	1.451 *	1.829 **	3.025 ***	1.557 ***
Fejér	3.156 ***	2.388 ***	1.372	2.129 ***
Veszprém	1.885 *	2.365 ***	3.262 ***	2.489
Csongrád	1.063	0.653	1.270	0.984
Zala	0.998	1.469	1.060	0.622
Gyõr	1.340	1.182	1.272	0.858
Budapest	.9510	1.392	1.484 **	1.472
Vas	1.399	2.185 ***	1.269	1.233
Number of observations	27,201	22,820	22,059	18,276
Pseudo-R2	0.1301	0.1400	0.1636	0.1356
Likelihood ratio test for time dummies	132.7 ***	225.3 ***	129.4 ***	101.7 ***
Constant of the log form	-0.931	-1.318	-2.729	-1.853

Significant at the ***0.01 **0.05 *0.1 level. References are: primary school, employee, weekly worktime >40 hours, manufacturing industry, Pest county. Counties ordered by employment ratio at 1997:1 (from lowest to highest).

Table A4

Job-loss (periods of employment started after 1989)
Discrete time duration model (logit), odds ratios, baseline hazard shown separately

	Men		Women	
	1997:1	1997:3	1997:1	1997:3
Age	0.893 ***	0.929 **	1.076 *	0.973
Age squared	1.002 ***	1.001 **	0.998 **	0.999
Education: vocational	0.813 *	0.604 ***	0.733 **	1.195
Secondary	0.680 ***	0.580 ***	0.529 ***	0.943
Higher	0.439 ***	0.360 ***	0.577 ***	0.630 *
Was unemployed before	1.389 ***	1.416 ***	1.001	1.471 ***
Member of partnership or coop	0.475 ***	0.613 *	1.053	0.731
Sole-proprietor	0.402 ***	0.781	0.719	0.777
Employer	0.179 ***	0.406 *	1.306	0.516
Casual worker	1.289	2.989 ***	2.306 *	1.528
Assisting family member	0.317 ***	1.035	0.834	0.889
Usual worktime: Variable	1.701 ***	1.342 **	1.344	2.105 ***
Zero	3.667 ***	1.861 ***	15.05 ***	5.704 ***
Less than 40 hours	1.952 ***	1.776 **	1.337 *	2.111 ***
Agriculture and food	1.457 ***	1.353 *	1.253	2.817 ***
Construction	1.336 *	1.299	1.041	0.828
Trade, hotels and restaurants	1.638 ***	1.398 **	1.052	1.274
Other non-public	1.204	0.756	0.774	0.809
Public sector	1.423 **	2.128 ***	0.709 *	0.702 *
Szabolcs	3.224 ***	4.368 ***	3.289 ***	1.889 **
Borsod	2.230 ***	4.400 ***	2.256 ***	2.131 ***
Nógrád	3.106 ***	5.765 ***	5.539 ***	1.936 *
Szolnok	2.589 ***	2.991 ***	3.179 ***	1.618
Hajdú	0.473 *	1.384	1.031	0.806
Heves	2.225 ***	5.550 ***	2.237 ***	2.244 ***
Békés	2.505 ***	1.843 *	1.965 **	0.988
Tolna	1.489	4.801	2.511 ***	2.796 ***
Baranya	1.880 **	1.554	1.566	0.404 *
Somogy	1.297	1.723	3.304 ***	1.454
Komárom	1.496	1.365	3.941 ***	1.946 *
Bács	1.229	2.373 **	3.930 ***	1.426
Fejér	2.782 ***	1.979 **	1.268	2.058 **
Veszprém	1.648 *	2.664 ***	5.445 ***	2.353 ***
Csongrád	1.326	0.893	1.412	0.503
Zala	0.721	1.834	1.734	0.541
Gyõr	1.145	1.318	1.352	0.495
Budapest	0.643 *	1.876	1.619	1.280
Vas	1.005	3.653 ***	1.679	0.934
Number of observations	16,805	14,603	12,759	10,663
Pseudo-R2	0.1160	0.1439	0.1711	0.1350
Likelihood ratio test for time dummies				
Constant of the log form	-1.677	-2.318	-4.063	-2.685

Significant at the ***0.01 **0.05 *0.1 level. References are: primary school, employee, weekly worktime >40 hours, manufacturing industry, Pest county. Counties ordered by employment ratio at 1997:1 (from lowest to highest).

Table A5
Job-finding 1997:1–1998:2
(Men who lost or left their job after 1992)
Discrete time duration model estimated with logit for clustered sample

	Odds ratio	Z	p	Sample mean
Age	0.979	-3.079	0.002	36.4
Education: vocational	1.263	1.769	0.077	0.49
Secondary	1.356	1.627	0.104	0.14
Higher	2.874	2.426	0.015	0.01
family status: child	0.837	-1.164	0.244	0.22
Receives UA	1.038	0.246	0.806	0.28
Wants a job (U<mean)	1.599	2.014	0.044	0.10
Wants a job (U>mean)	1.702	2.350	0.019	0.14
Searching (U<mean)	1.139	0.635	0.525	0.30
Searching (U>mean)	1.921	3.352	0.000	0.29
Unemployment rate (micro-region)	0.963	-1.947	0.052	11.6
Informal economy (county)	0.911	-1.631	0.103	22.5
Self-employment ratio (county)	1.047	2.209	0.027	7.5
Village	1.245	1.767	0.077	0.49
Budapest	1.009	0.018	0.985	0.09
Hajdú county	0.247	-3.944	0.000	0.08
Mean of the dependent variable				0.135
Constant of the log functional form				1.025
Mean duration at sampling (quarters)				5.131
Number of observations				3,611
Pseudo-R2				0.058
Likelihood ratio test for dropping duration dummies (sign. 0.0000)				53.35

Baseline hazard (95% confidence intervals shown)

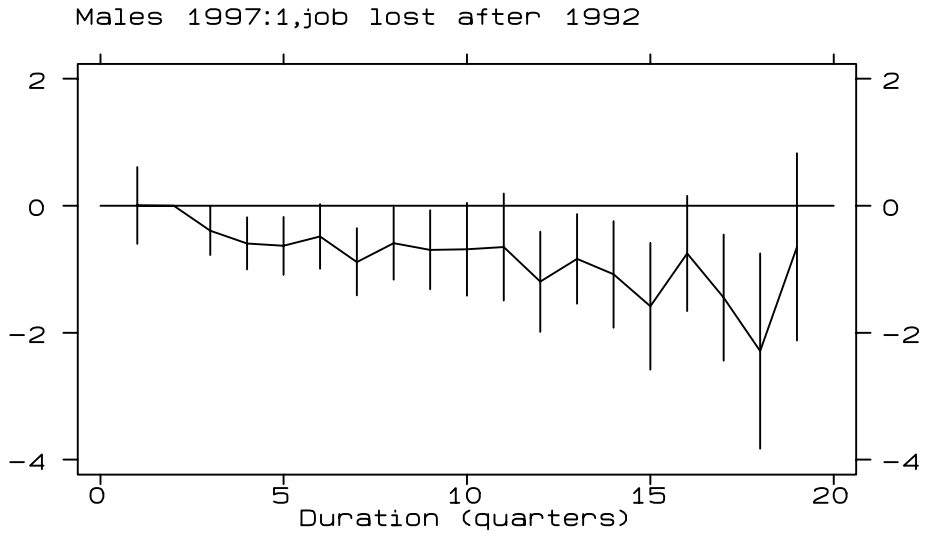


Table A6

Job-finding 1997:3–1998:4
(Men who lost or left their job after 1992)
Discrete time duration model estimated with logit for clustered sample

	Odds ratio	Z	p	Sample mean
Age	0.972	-3.894	0.000	36.0
Education: vocational	1.750	3.857	0.000	0.49
Secondary	1.710	2.676	0.007	0.14
Higher	2.254	2.021	0.043	0.02
family status: child	0.987	-0.083	0.934	0.24
Receives UA	1.155	0.926	0.355	0.28
Wants a job (U<mean)	2.012	3.056	0.002	0.11
Wants a job (U>mean)	0.978	-0.082	0.934	0.12
Searching (U<mean)	1.519	2.241	0.025	0.29
Searching (U>mean)	1.513	2.029	0.042	0.24
Unemployment rate (micro-region)	0.981	-0.722	0.470	11.1
Informal economy (county)	0.878	-2.124	0.034	22.4
Self-employment ratio (county)	1.024	1.112	0.266	7.61
Village	1.205	1.404	0.160	0.46
Budapest	3.201	2.520	0.012	0.09
Mean of the dependent variable				0.127
Constant of the log functional form				1.328
Mean duration at sampling (quarters)				5.339
Number of observations				2,668
Pseudo-R2				0.0529
Likelihood ratio test for dropping duration dummies (sign: 0.0010)				40.78

Baseline hazard (95% confidence intervals shown)

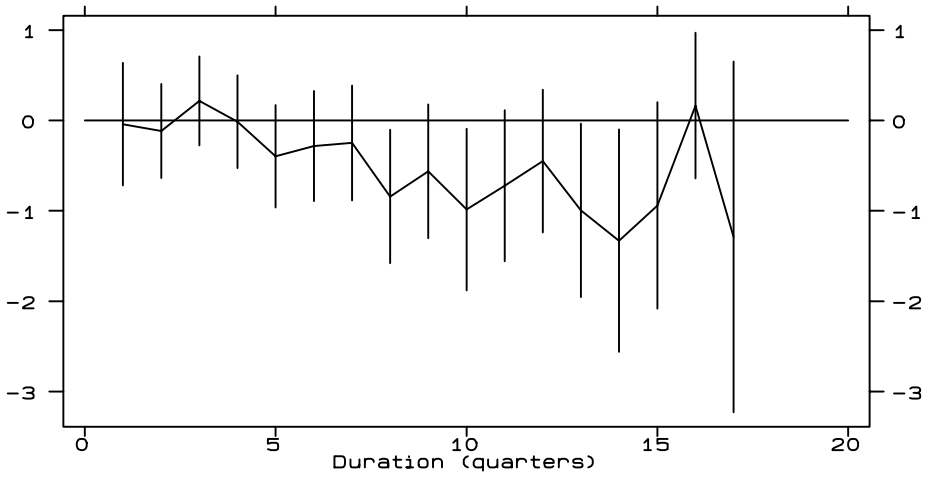


Table A7
Job-finding 1997:1–1998:2
(Women who lost or left their job after 1992)
Discrete time duration model estimated with logit for clustered sample

	Odds ratio	Z	p	Sample mean
Age	1.249	2.879	0.004	32.3
Age squared	0.997	-2.880	0.004	1121.0
Education: vocational	1.533	2.301	0.021	0.31
Secondary	1.746	2.965	0.003	0.33
Higher	1.830	1.910	0.056	0.08
family status: child	2.139	2.568	0.010	0.04
Number of children	1.833	-2.333	0.020	1.58
Receives childcare benefit	1.747	-1.353	0.176	0.54
Receives UA	0.673	-1.724	0.085	0.09
Wants a job (U<mean)	1.963	2.835	0.005	0.08
Wants a job (U>mean)	1.854	2.238	0.025	0.08
Searching (U<mean)	3.055	5.091	0.000	0.12
Searching (U>mean)	1.568	1.716	0.086	0.08
Unemployment rate (micro-region)	0.997	-0.151	0.880	10.2
Informal economy (county)	0.826	-2.600	0.009	23.2
Self-employment ratio (county)	1.049	2.043	0.041	7.75
Village	1.037	0.254	0.800	0.39
Budapest	2.451	1.632	0.103	0.16
Vas county	2.898	3.250	0.001	0.02
Mean of the dependent variable				0.063
Constant of the log functional form				-2.687
Mean duration at sampling (quarters)				6.786
Number of observations				4,829
Pseudo-R2				0.0828
Likelihood ratio test for dropping duration dummies (sign: 0.0000)				61.77

Baseline hazard (95% confidence intervals shown)

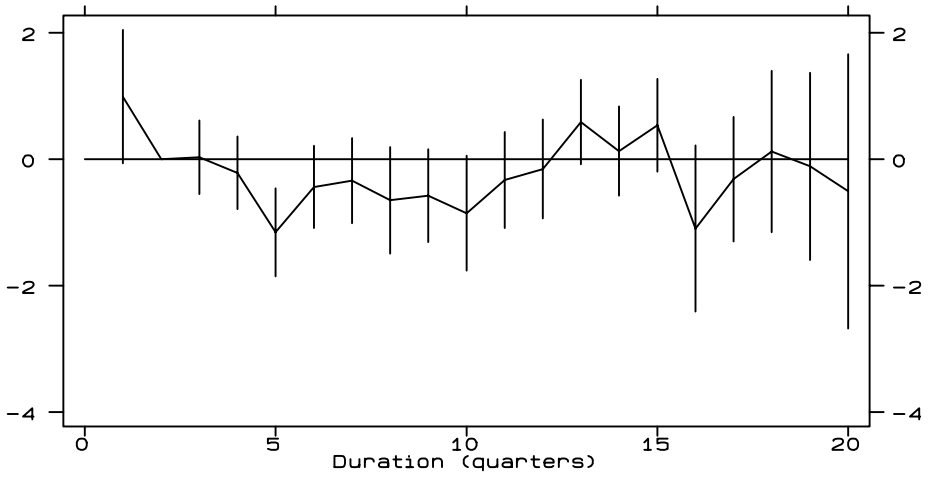


Table A8
Job-finding 1997:3–1998:4
(Women who lost or left their job after 1992)
Discrete time duration model estimated with logit for clustered sample

	Odds ratio	Z	p	Sample mean
Age	1.183	2.437	0.015	31.6
Age squared	0.998	-2.447	0.014	1079.0
Education: vocational	1.718	2.805	0.005	0.31
Secondary	2.353	4.535	0.000	0.30
Higher	3.339	4.054	0.000	0.07
family status: child	2.089	2.523	0.012	0.05
Number of children	1.049	0.619	0.536	1.54
Receives childcare benefit	0.970	-0.151	0.880	0.50
Receives UA	0.829	-0.791	0.429	0.12
Wants a job (U<mean)	2.605	4.044	0.000	0.11
Wants a job (U>mean)	1.898	2.774	0.006	0.07
Searching (U<mean)	3.631	6.072	0.000	0.13
Searching (U>mean)	1.830	2.114	0.034	0.06
Unemployment rate (micro-region)	0.983	-0.674	0.501	9.77
Informal economy (county)	0.804	-3.074	0.002	23.0
Self-employment ratio (county)	1.020	0.710	0.478	7.75
Village	0.978	-0.157	0.875	1.39
Budapest	3.056	2.204	0.028	0.14
Vas county	2.397	2.279	0.023	0.02
Mean of the dependent variable				0.074
Constant of the log functional form				-1.531
Mean duration at sampling (quarters)				6.929
Number of observations				3,989
Pseudo-R2				0.0878
Likelihood ratio test for dropping duration dummies (sign: 0.0000)				52.84

Baseline hazard (95% confidence intervals shown)

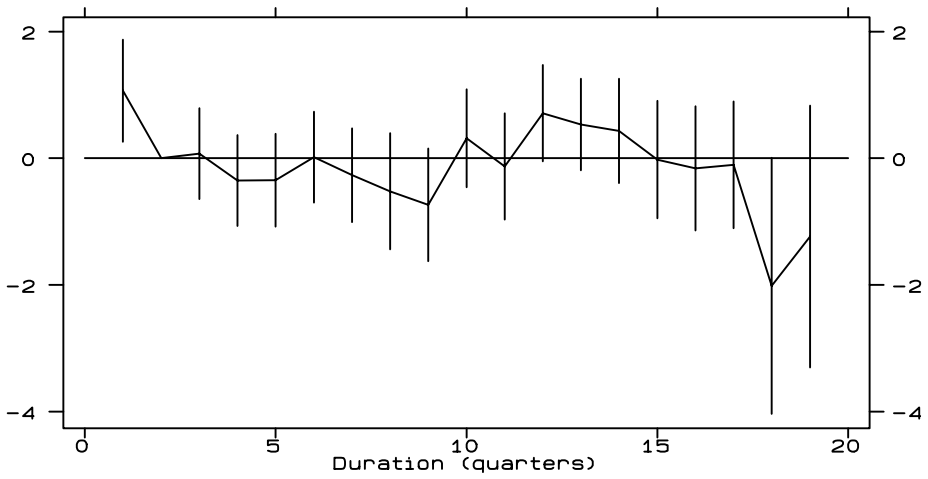


Table A9
Job-loss 1997:1–1998:2
(Men starting a job after 1992)
Discrete time duration model estimated with logit for clustered sample

	Odds ratio	Z	p	Sample mean
Age	0.916	-1.874	0.061	33.2
Age squared	1.001	2.023	0.043	1207
Education: vocational	0.827	-1.022	0.307	0.48
Secondary	0.760	-1.193	0.233	0.25
Higher	0.623	-1.312	0.190	0.10
Was unemployed before	1.477	2.703	0.007	0.41
Member of partnership or coop	0.517	-1.813	0.070	0.05
Sole-proprietor	0.449	-2.963	0.003	0.09
Employer	0.254	-1.937	0.053	0.03
Casual worker	1.113	0.245	0.806	0.01
Assisting family member	0.366	-1.510	0.131	0.01
Usual worktime: Variable	2.231	3.733	0.000	0.14
Zero	2.149	2.706	0.007	0.04
Less than 40 hours	2.036	1.844	0.065	0.03
Agriculture and food	1.438	1.591	0.112	0.14
Construction	1.361	1.331	0.183	0.13
Trade, hotels and restaurants	1.437	1.563	0.118	0.20
Other non-public	1.230	0.774	0.439	0.20
Public sector	1.506	1.592	0.111	0.08
Unemployment rate (micro-region)	1.040	2.139	0.032	9.2
Informal economy (county)	0.833	-2.843	0.004	23.2
Self-employment ratio (county)	1.012	0.471	0.638	7.9
Village	1.223	1.361	0.174	0.38
Budapest	2.593	1.725	0.084	0.17
Second quarter	1.072	0.609	0.542	0.28
Third quarter	1.962	4.860	0.000	0.22
Fourth quarter	0.928	-0.310	0.757	0.10
Mean of the dependent variable				0.045
Constant of the log functional form				1.480
Mean duration at sampling (quarters)				5.75
Number of observations				9,810
Pseudo-R2				0.0974
Likelihood ratio test for dropping duration dummies (sign: 0.0000)				81.30

Table A10

Job-loss 1997:1–1998:2
(Women starting a job after 1992)
Discrete time duration model estimated with logit for clustered sample

	Odds ratio	Z	p	Sample mean
Age	1.053	0.818	0.413	33.1
Age squared	0.999	-0.946	0.344	1196
Education: vocational	0.701	-1.664	0.096	0.30
Secondary	0.577	-2.330	0.020	0.36
Higher	0.518	-1.631	0.103	0.12
Was unemployed before	1.216	1.153	0.249	0.36
Member of partnership or coop	1.289	0.502	0.616	0.04
Sole-proprietor	0.766	-0.754	0.451	0.07
Employer	0.658	-0.545	0.586	0.01
Casual worker	2.391	1.313	0.189	0.00
Assisting family member	1.949	0.835	0.404	0.01
Usual worktime: Variable	1.406	1.012	0.312	0.07
Zero	11.771	9.402	0.000	0.04
Less than 40 hours	1.507	1.560	0.119	0.09
Agriculture and food	1.435	1.224	0.221	0.07
Construction	0.735	-0.382	0.702	0.02
Trade, hotels and restaurants	1.145	0.594	0.552	0.26
Other non-public	0.928	-0.262	0.793	0.17
Public sector	0.727	-1.158	0.247	0.25
Unemployment rate (micro-region)	1.017	0.590	0.555	8.9
Informal economy (county)	0.808	-2.367	0.018	23.6
Self-employment ratio (county)	1.015	0.507	0.612	7.8
Village	1.194	0.974	0.330	0.34
Budapest	3.443	1.931	0.053	0.21
Second quarter	1.646	4.149	0.000	0.28
Third quarter	2.662	6.339	0.000	0.22
Fourth quarter	1.360	1.103	0.270	0.09
Mean of the dependent variable				0.056
Constant of the log functional form				0.995
Mean duration at sampling (quarters)				5.49
Number of observations				7,342
Pseudo-R2				0.1305
Likelihood ratio test for dropping duration dummies (sign: 0.0003)				41.41

Table A11
Job-loss 1997:3–1998:4
(Men starting a job after 1992)
Discrete time duration model estimated with logit for clustered sample

	Odds ratio	Z	p	Sample mean
Age	0 .929	-1.806	0.071	33.1
Age squared	1.001	1.743	0.081	1200
Education: vocational	0.614	-3.454	0.000	0.47
Secondary	0.699	-1.928	0.054	0.25
Higher	0.416	-2.322	0.020	0.10
Was unemployed before	1.312	2.097	0.036	0.42
Member of partnership or coop	0.708	-0.868	0.386	0.05
Sole-proprietor	0.732	-1.132	0.258	0.08
Employer	0.333	-1.980	0.048	0.02
Casual worker	2.857	3.270	0.001	0.02
Assisting family member	0.961	-0.077	0.939	0.01
Usual worktime: Variable	1.444	1.857	0.063	.014
Zero	2.354	3.454	0.000	0.05
Less than 40 hours	1.901	1.724	0.085	0.02
Agriculture and food	1.271	1.215	0.224	0.14
Construction	1.355	1.510	0.131	0.13
Trade, hotels and restaurants	1.465	1.801	0.072	0.19
Other non-public	0.813	-0.876	0.381	0.17
Public sector	2.348	4.352	0.000	0.10
Unemployment rate (micro-region)	1.065	3.785	0.000	9.3
Informal economy (county)	0.839	-2.776	0.005	23.1
Self-employment ratio (county)	0.986	-0.663	0.507	7.8
Village	1.410	2.529	0.011	0.38
Budapest	5.003	3.207	0.001	0.15
Second quarter	0.487	-2.225	0.026	0.11
Third quarter	0.791	-1.231	0.218	0.46
Fourth quarter	0.991	-0.045	0.964	0.25
Mean of the dependent variable				0.044
Constant of the log functional form				2.204
Mean duration at sampling (quarters)				5.53
Number of observations				8,483
Pseudo-R2				0.1323
Likelihood ratio test for dropping duration dummies (sign: 0.0000)				98.27

Table A12
Job-loss 1997:3–1998:4
(Women starting a job after 1992)
Discrete time duration model estimated with logit for clustered sample

	Odds ratio	Z	p	Sample mean
Age	0.923	-1.340	0.180	32.7
Age squared	1.000	1.092	0.275	1167
Education: vocational	1.230	0.968	0.333	0.29
Secondary	0.864	-0.611	0.541	0.39
Higher	0.514	-1.648	0.099	0.12
Was unemployed before	1.533	2.684	0.007	0.38
Member of partnership or coop	0.690	-0.588	0.557	0.03
Sole-proprietor	0.729	-0.869	0.385	0.05
Employer	0.352	-1.352	0.177	0.02
Casual worker	1.186	0.318	0.750	0.00
Assisting family member	0.994	-0.012	0.990	0.01
Usual worktime: Variable	1.639	1.771	0.077	0.06
Zero	5.825	8.236	0.000	0.09
Less than 40 hours	1.970	2.147	0.032	0.07
Agriculture and food	2.840	3.963	0.000	0.07
Construction	0.268	-1.198	0.231	0.01
Trade, hotels and restaurants	1.455	1.598	0.110	0.26
Other non-public	1.184	0.557	0.578	0.17
Public sector	0.826	-0.712	0.477	0.24
Unemployment rate (micro-region)	1.019	0.877	0.380	8.9
Informal economy (county)	0.874	-1.727	0.084	23.4
Self-employment ratio (county)	0.974	-0.889	0.374	7.8
Village	1.427	2.115	0.034	0.35
Budapest	2.731	1.614	0.107	0.18
Second quarter	0.650	-1.139	0.255	0.10
Third quarter	1.182	0.637	0.524	0.47
Fourth quarter	1.272	0.899	0.369	0.25
Mean of the dependent variable				0.037
Constant of the log functional form				1.264
Mean duration at sampling (quarters)				5.45
Number of observations				6,174
Pseudo-R2				0.1239
Likelihood ratio test for dropping duration dummies (sign: 0.0000)				53.2

Table A13
Job-finding equations controlled for county-specific differences in the rate of job-loss

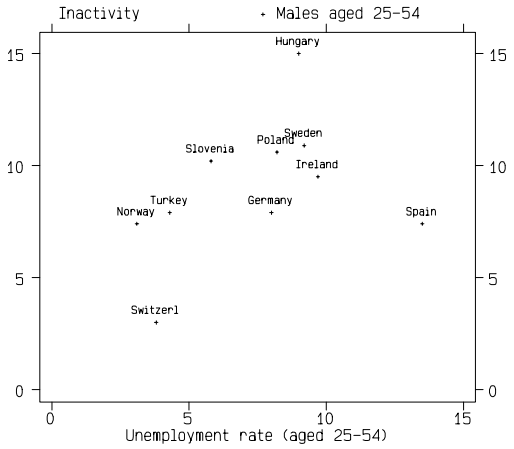
	1997:1		1997:3			
	Men	Women	Men	Men	Women	Women
Age	0.985	1.159	0.973	0.973	1.096	1.093
	(-2.62)	(2.03)	(-4.00)	(-4.00)	(1.42)	(1.38)
Age squared	..	0.998	..	..	0.999	0.999
		(-2.06)			(-1.51)	(-1.48)
Education: vocational	1.238	1.483	1.791	1.765	1.785	1.738
	(1.62)	(2.14)	(3.67)	(3.59)	(2.99)	(2.85)
Secondary	1.309	1.681	1.735	1.736	2.389	2.400
	(1.45)	(2.77)	(2.46)	(2.46)	(4.66)	(4.67)
Higher	2.688	1.725	2.179	2.135	3.259	3.254
	(2.33)	(1.77)	(1.37)	(1.32)	(4.07)	(4.08)
Number of children	..	0.858	..	..	1.111	1.109
		(-1.74)			(1.38)	(1.37)
Receives UA	1.017	0.716	1.149	1.167	0.861	0.854
	(0.12)	(-1.45)	(0.79)	(0.89)	(-0.62)	(-0.66)
Wants a job without searching	1.678	2.124	1.452	1.483	2.344	2.366
	(2.69)	(4.10)	(1.76)	(1.86)	(4.57)	(4.65)
Searching	1.519	2.958	1.506	1.533	3.247	3.261
	(2.39)	(5.72)	(2.26)	(2.39)	(6.63)	(6.65)
Registered unemployment	0.973	0.971	0.976	0.975	0.941	0.950
	(-1.87)	(-1.56)	(-1.19)	(-1.23)	(-2.58)	(-2.21)
Self-employment ratio	1.059	1.025	1.017	1.009	1.015	0.993
	(3.02)	(1.10)	(0.83)	(0.44)	(0.55)	(-0.25)
Informal economy	0.929	0.931	0.995	1.020	0.917	0.934
	(-1.88)	(-1.78)	(-0.12)	(0.47)	(-2.18)	(-1.64)
Job-loss rate*	1.530	1.374	1.137	..	1.483	
	(3.65)	(1.79)	(0.77)		(2.42)	
Job-loss rate, lagged*	n.a.	n.a.	..	1.305	..	1.513
				(2.05)		(2.28)
Number of observations	3,611	4,829	2,660	2,660	3.966	3.966
Constant of the log form	-0.584	-4.563	-1.261	-1.507	-2.637	-3.016
Pseudo-R2	0.0494	0.0711	0.0463	0.0482	0.0803	0.0801
L. ratio test for duration	52.39	64.15	44.74	44.12	55.06	55.42
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)

*) Log of the county-specific odds ratios presented in Table A3. 'Lagged' stands for estimates from the 1997:1 sample.

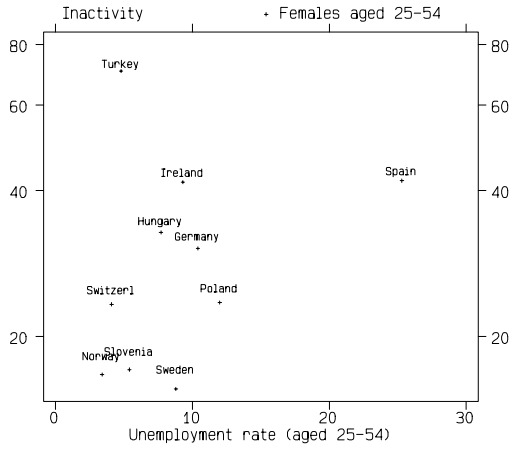
Appendix - Figures

Figure A1
Inactivity versus search unemployment among those aged 25–54
in selected European countries, 1997

Men

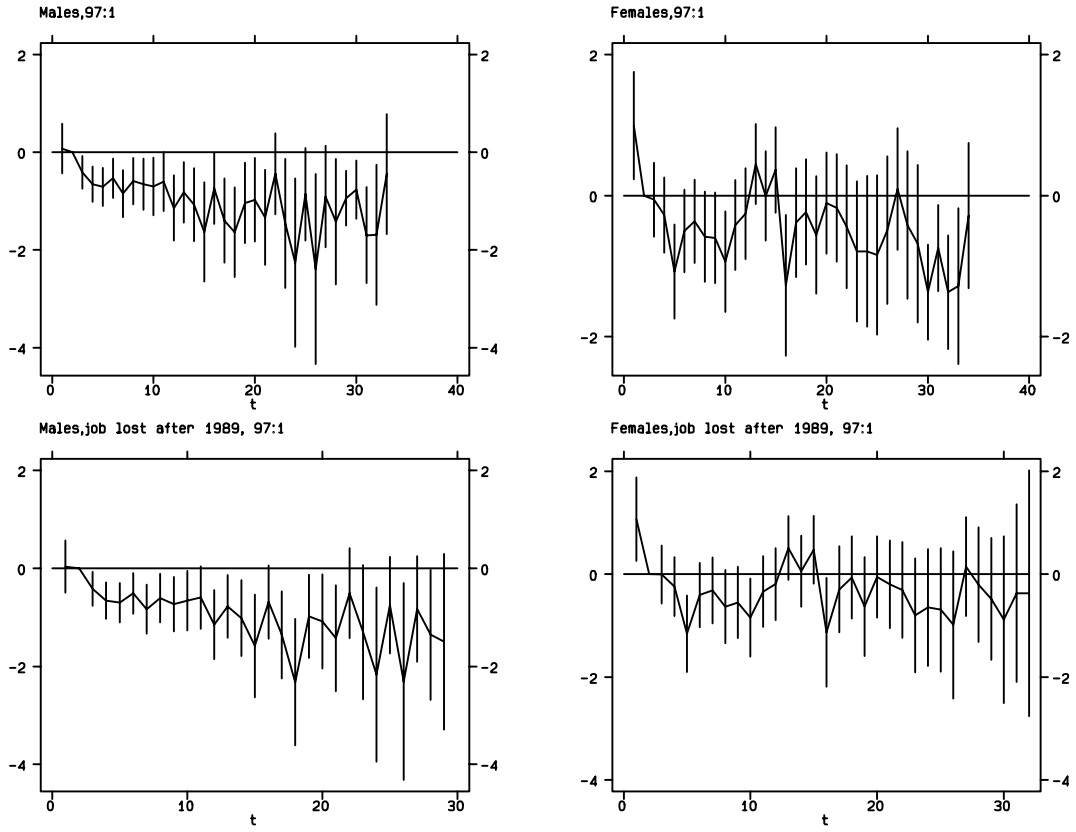


Women



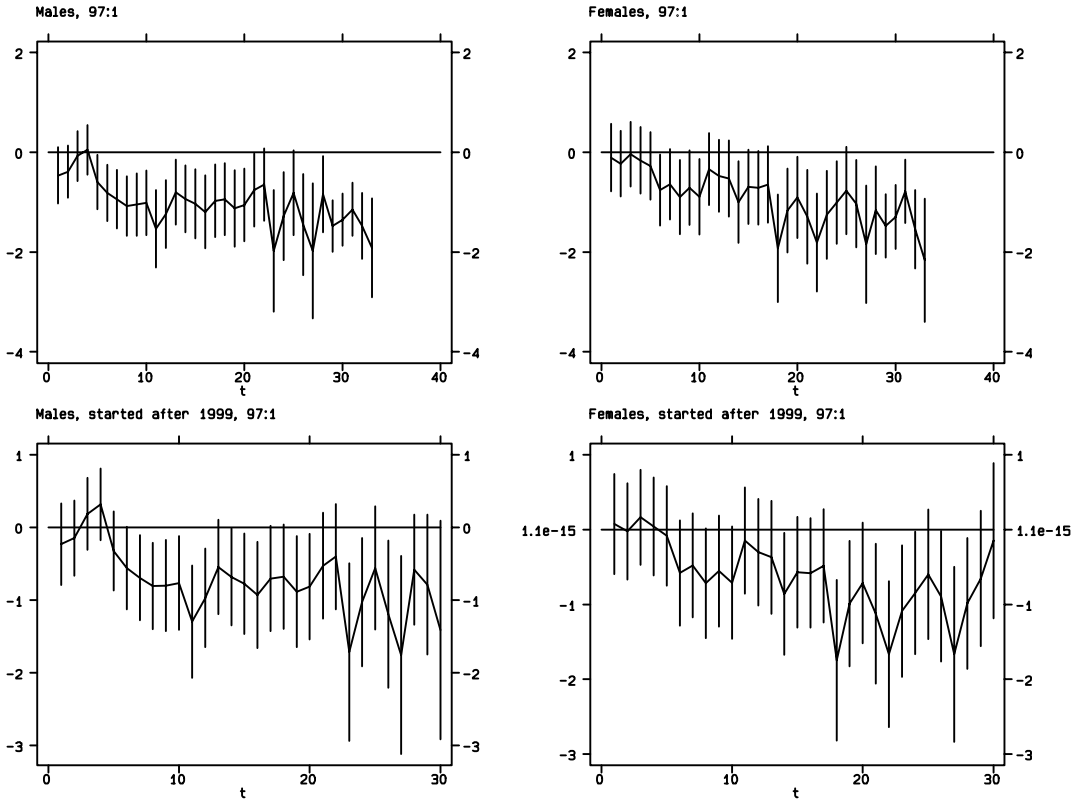
KILM 1999

Figure A2
Job-finding—Baseline hazard
(95% confidence intervals shown)



See also Tables A1 and A2

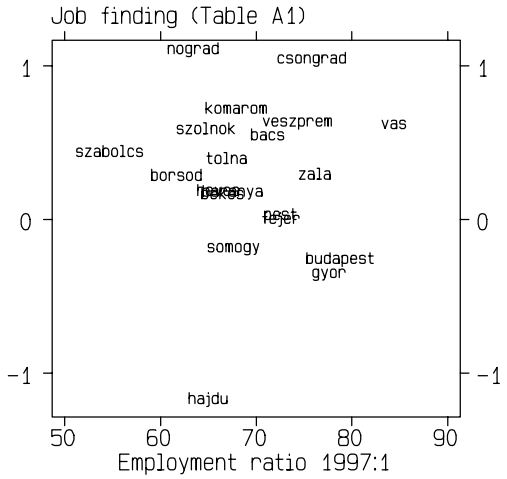
Figure A3
Job-loss—Baseline hazard
(95% confidence intervals shown)



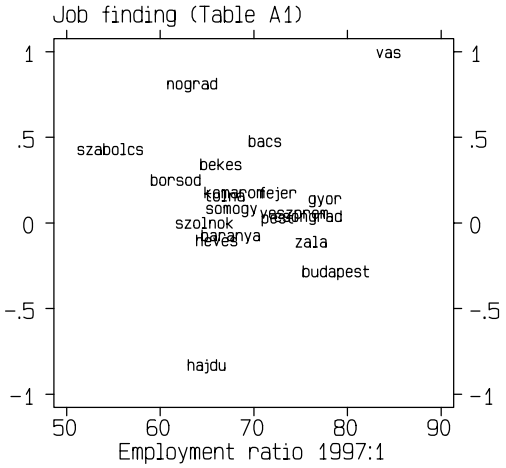
Also see Tables A3 and A4

Figure A4
Regional differentials in job-finding* and the level of employment

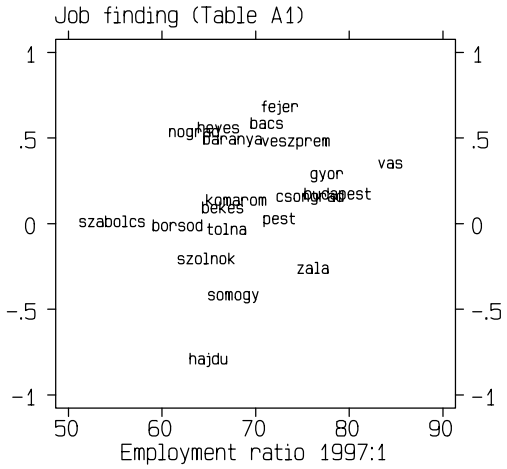
Men 1997:1



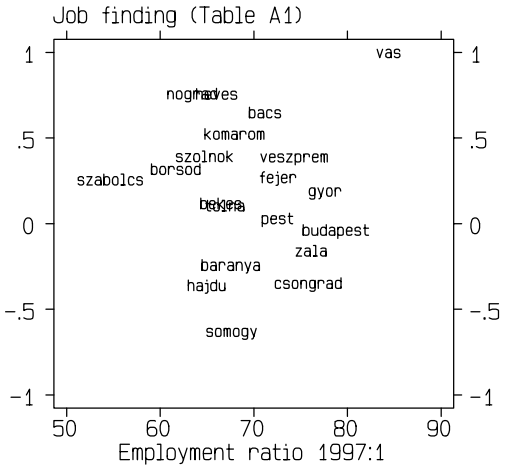
Women 1997:1



Men 1997:3



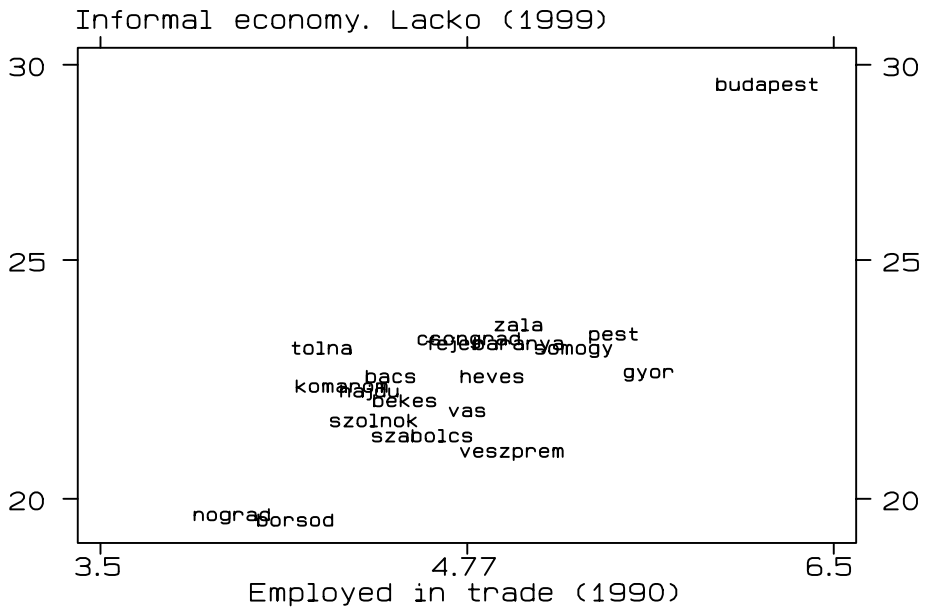
Women 1997:3



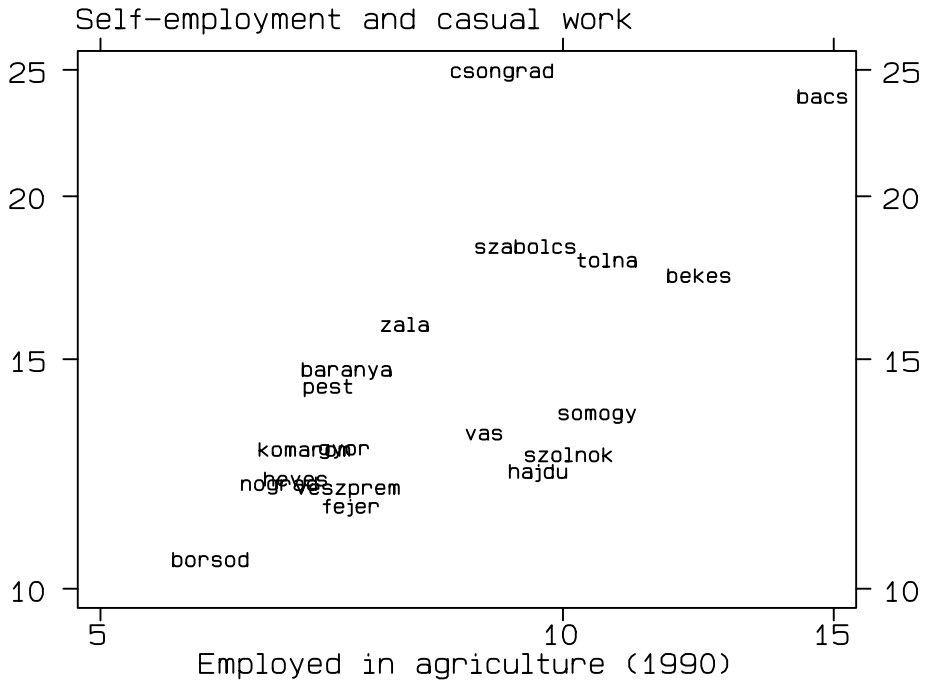
*) Coefficients from Table A1

Figure A5

(a) The size of the trade sector and estimates of the informal economy (Lackó 1999) by counties



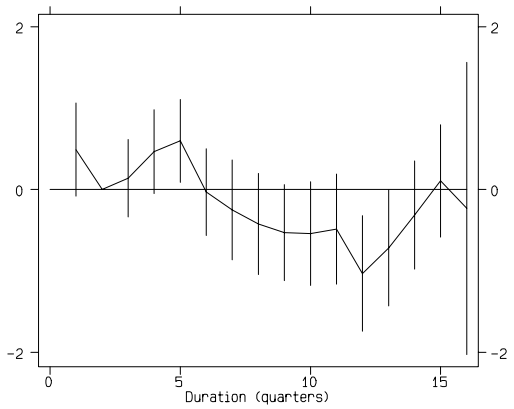
(b) The size of the trade sector and the share of self-employed and casual workers (1997–1998) by counties



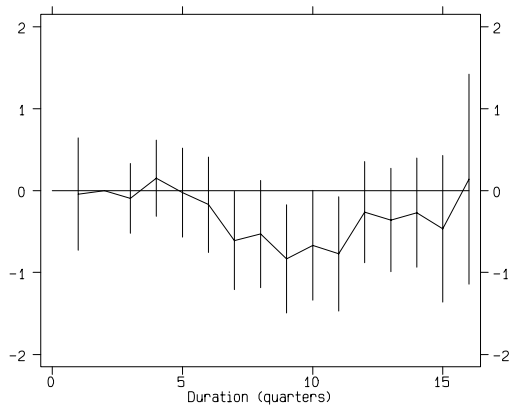
Note: Budapest excluded from (b). For the definitions see text.

Figure A6
Baseline hazard of job-loss
(Workers starting a job after 1992)

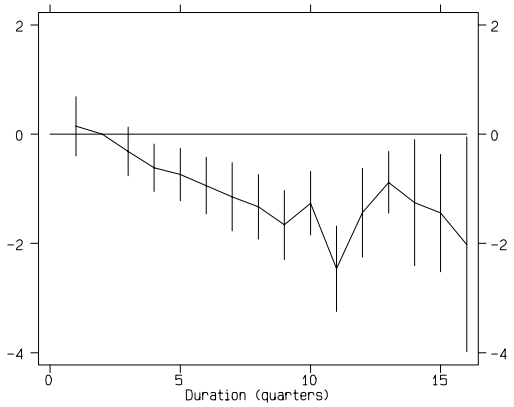
Men, 1997:1



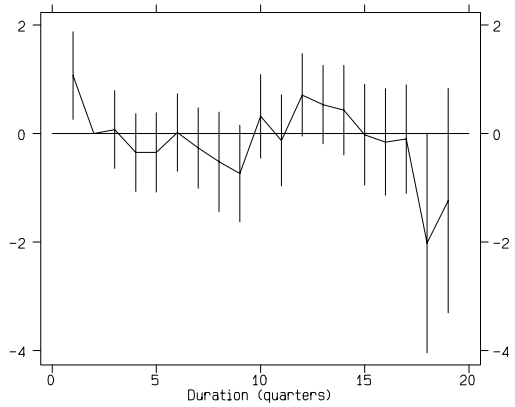
Women, 1997:1



Men, 1997:3

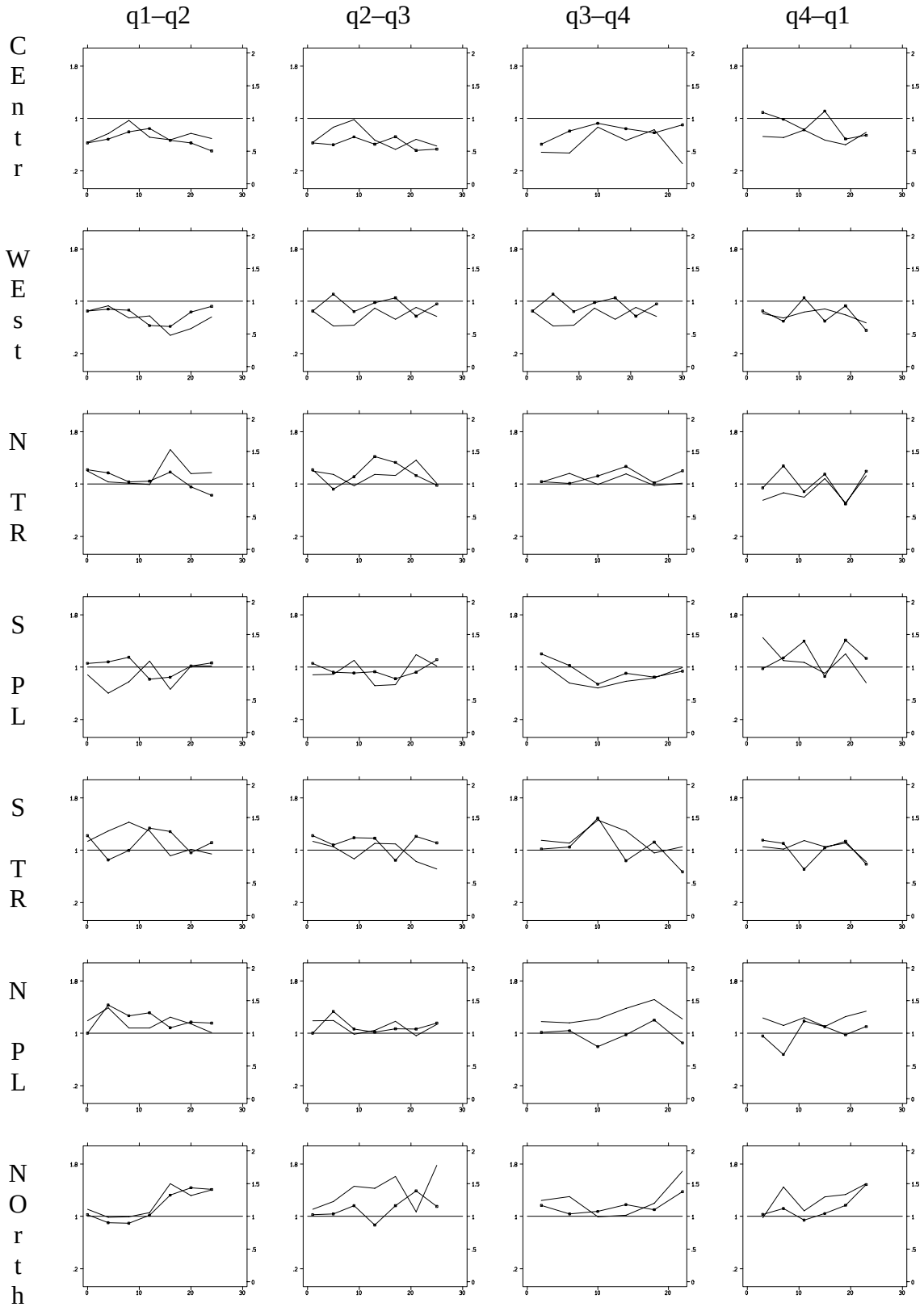


Women, 1997:3



See also Tables A9–A12

Figure A7
Quarterly flows between employment and non-employment 1992–1998
By regions and quarters, national average rates = 1



O = flow from E to NE . = flow from NE to E. % of WAPOP

Appendix 1

The samples referenced in Tables A5–A12

Sample	Workers	Periods worked	Transitions during quarter after sampling				
			1	2	3	4	5
Non-employed							
1997:1, men	1,537	3,611	232	146	92	27	12
1997:1, women	1,847	4,832	132	92	70	32	7
1997:3, men	1,286	2,699	182	75	54	27	9
1997:3, women	1,757	3,991	146	71	37	33	18
Employed							
1997:1, men	3,512	9,810	153	125	169	29	17
1997:1, women	2,641	7,342	112	139	143	26	6
1997:1, men	3,598	8,483	216	112	59	18	11
1997:3, women	2,661	6,174	142	66	30	13	6

Appendix 2

Preliminary results for income-loss from job-loss based on HBS data

We try to measure the income effect of job-loss using a special database built of households observed in the Hungarian Household Budget Survey (HBS). The sample will be used for a detailed study of income loss from job-loss and income gain from job-finding. In this Appendix we present some preliminary findings on change of income in households losing a wage earner.

The HBS is conducted regularly by the Hungarian Central Statistics Office (HCSO). It contains information on household consumption and income, demographics and detailed information on the household members. Its sample size varied considerably over time, but always remained around 10,000 households. The survey has a three-year rotating panel structure, so that one-third of the cross-section sample is carried over three years, and two-thirds are carried over two years. We used the latter structure and compiled four two-period panels from the period between 1993 and 1998.

Gross income was computed using the HCSO definitions and included agricultural sales and expenses but excludes 'rainfall' cash-inflows from selling durables or property, or from raising credit. Net income is gross income less taxes and social security contributions. All monetary measures have been converted to their 1998 value using the consumer price index. We chose the CPI against the wage-index because of the large number and variety of sources of income and types of consumption.

The database referenced here is a pool of four two-year panels (from 1993 to 1998). We selected those households where only one person shifted from employment to non-employment[20] between the first and second period. Changes are registered for the working-age population (those aged over 15 and below 54 years of age for women and over 15 and below 59 for men). Since our main focus is the analysis of income change we imposed additional restrictions on the data to eliminate unwanted effects. We dropped pensioner households from the sample and those where the number and intra-family status of household members have altered over time in order to control for demographic change.[21] The resulting sample contains 5,460 households with 521 job-losers. There is a net loss of jobs in the sample, but this is almost completely eliminated by weighting.

Since the HBS is not a snapshot of a given point in time but is instead a pool of monthly sub-samples, it gives income data for those who changes status. These are registered as annual totals, and there is no duration record for most part of the timeframe. The individual's annual income is finally combined with annual household income. Even if we had access to the individual snapshots corresponding to the statuses, we could not separate the family income of one status-period from the other. As a result, irrespective of whether a person is labeled 'employed' or 'non-employed,' none of them has a 'clean' record, i.e. with only labor income or unemployment benefit though it may happen that she/he receives only one of them at a given point in time. Two necessary limitations emerge from this. The first is that we are unable to account properly with period histories. The second is, as a corollary, that the figures will always carry the effect of composition in a regional breakdown. They will never refer to a 'representative' household, but are real macro-aggregates. If the periods of non-activity are dissimilarly distributed across regions, our estimates will be biased.

The regional distribution of the sample[22] is shown in Table 1 by status change. The last column shows net income figures for every region.

Table 2 reports changes in income levels. The mean income levels for stable households are estimated to have a slight downward trend between two panel periods. This is consistent with the overall drop in real income from 1993 to 1998. On average, job-losers lost a quarter of their income in the year of status change. Those in receipt of UI or UA in the second period lost only 18%. The latter

[20] Change is defined as a transition from employment to unemployment, retirement or 'other,' i.e. 'other' than all the listed activity categories. In this way we do not register the transition from/to student status and maternity leave, the two second most frequent causes of change for certain age and age/gender groups.

[21] The first correction does not affect the status changers (by definition), but the second does. We experimented by comparing the demographically corrected and uncorrected results, and found that the distributional characteristics of the sample does not change substantially.

[22] The regional distribution is by no means comparable to that of the whole population. This is mainly due to the severe sample attrition of the panels, which is not corrected by the weight used.

seem to belong to families with income levels close to the average whereas job-losers not in receipt of benefit in the second period enjoy income levels of 8% above the average.

Table 1 of Appendix 2 Regional distribution of the status changers

	Stable	Job-loser	income*
Central	25.42	20.56	455
North Trans-Danubian	9.86	14.60	406
West Trans-Danubian	11.81	8.84	457
South Trans-Danubian	13.18	14.99	457
North	13.21	12.60	411
North Plain	15.85	20.71	399
South Plain	10.67	7.70	395
Total/Average	100.00	100.00	

*First period

Table 2 of Appendix 2 Group means of per capita annual real household income by status change (In 1998 Forints (x1000) and percentages)

	Income					
	Period 1	Period 2	Change		Corrected change	
			Ft	%	Ft	%
Stable	436	429	-7	-2	0	
Job-losers						
– All	473	355	-118	-25	-111	-23
– Receiving UI or UA	440	362	-78	-18	-71	-16

Income is net of deductions. Both income and expenditure are total annual *per capita* measures. *Per capita* is understood here as the usage of consumption units, following the recent standards of the HCSO. In households with at least one active earner, all additional adults weight 0.75. The first child (under 15) weights 0.65, the second 0.5 and every subsequent child 0.4. In households with no active earner, the first adult weights 0.9, and all subsequent adults weight 0.65. This scale is less progressive than the OECD scale. Our figures are higher than those in the HCSO yearbook, since those are calculated by using the raw number of household members.

Table 3 presents the mean changes and corrected changes for the seven macro-regions. (Unfortunately the sample is too small to breakdown benefit recipients by region or type of benefit). Income loss is substantially below the mean in the South Trans-Danubian region and both the southern and the northern parts of the Plain.

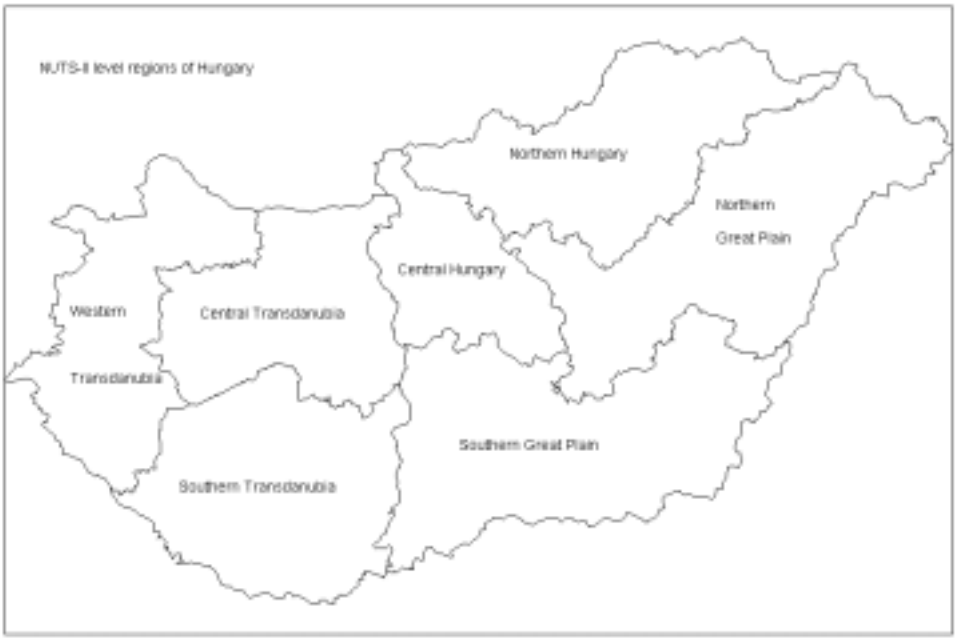
Table 3 of Appendix 2 Income changes of job-loser households by region

	raw	corrected
Central	-29	-27
North Trans-Danubian	-29	-24
West Trans-Danubian	-22	-22
South Trans-Danubian	-17	-16
North	-25	-24
North Plain	-14	-12
South Plain	-20	-13

Appendix 3

Regions of Hungary according to the EUROSTAT nomenclature

Map 1 NUTS-II level regions



Map 2 NUTS-III level regions

Map 3 NUTS-IV level regions