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ABSTRACT

Returns to Returning: Who Went Abroad and What Does it Matter?*

We examine the labor market performance of return migrants using the Hungarian Household Panel Survey. Two distinct selection issues are considered in the estimation of the earnings equation. The result that there is a "premium" to work experience abroad for women is robust across models we considered. This premium varies by former host country. For men, the return to working abroad is not generally significant, except for those Hungarians who worked in non-European OECD countries.

JEL Classification: J61, J24, F22
Keywords: return migration, earnings, human capital

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Returns to Returning: Who Went Abroad and What Does it Matter?

1. Introduction and Background

This paper addresses one issue surrounding the phenomenon of return migration. In return migration, the migrant, after spending some time in a host country, returns to his or her country-of-origin. Some migrants work until retirement in the host country, and then retire to their home country. Some return to their home country and participate in the labor market. This latter group of return migrants is the focus of this paper.

The theory of return migration generally examines the phenomena as part of life-cycle planning. In this framework, return migration is part of optimal decision making and is related to the savings behavior of migrants, their investment in human capital acquisition in the host country, and the relative wage differences between the host and sending country (see, for example, Djajic and Milbourne (1988), Galor and Stark (1991)). Dustmann (1997a, 1997b), in particular, has emphasized the role of human capital accumulation in the host country as a reason for return migration.

The empirical literature has largely studied return migration from the host country, examining the determinants of which migrants leave and when, the skills of the return migrants versus those who stay, and host country policies toward the migrants (Borjas and Bratsberg (1996), Dustmann (1996), Schmidt (1994)). Recently, Barrett and Trace (1998) and Cohen and Haberfeld (1998) have examined, in detail, the selectivity of return migrants. Bauer and Gang (1998) have analyzed the duration of migration abroad.

In this paper we focus on the return migrants' accumulation of human capital while abroad, and its relevance for earnings generation in the home country (see Dustmann (1997a, 1997b) for a theoretical treatment of this issue as a reason for return migration). Two selection issues arise. First, those who go abroad may be a self-selected group.

For example, they may have done better (or worse) regardless of whether or not they had gone abroad. In addition, we face the standard participation selection issue. We handle these two selection issues and the earnings equation estimation jointly, using maximum likelihood estimation.

We look at return migrants in Hungary in the early 1990's, a period during which in Hungary there was decreased output and incomes, decreased employment and increased inequality (Kattuman and Redmond (1997)). While there are no reliable official statistics regarding emigration by Hungarians, we do know that the Hungarian government has promoted the temporary migration of workers. For example, it has guest-worker agreements with Germany allowing project-linked and individual employment of Hungarians in Germany for limited periods (See Bauer and Zimmermann (1997) for a detailed description of these arrangements).

In the next section we discuss the data that we use in detail. In section 3, we review the econometric issues and models we consider in this paper. Results are analyzed in section 4. Section 5 concludes.

2. Data

We use the Hungarian Household Panel Survey (HHPS), a unique data set from the Social Research Informatics Centre, Budapest University of Economics. The first wave of the survey was drawn in 1992 (see Sik (1995) for a description). In 1993 and 1994, a question on whether an individual has lived or worked in a foreign country was included; we draw our sample from these two years. We restrict our sample to those individuals who are in their working "life," that is, those between 18 and 60 years old in 1994. Out of 3297 individuals, 172 were identified as having worked abroad. For the purposes of this paper, the terms migrant, return migrant and going abroad, are

interchangeable.

Table 1 contains the means of the variables used in the analysis, for all observations and for those who are working. The earnings variable is monthly earnings from a person's main job (natural log of monthly earnings in forints). Marital status, family status and Budapest at 14 are equal to one for those who are married, heads of household and are living in Budapest at age 14, respectively. Training takes a value of one if an individual has gone through some job-related training in the past year. If a person receives benefits, such as an office car, medical care, or life/pension insurance, the variable benefits takes on the value one. A series of industry dummy variables is defined. An individual's employment status is controlled for by the introduction of dummy variables for when the individual is self-employed and when the job held is non-manual. Information on the nationality of the company a person works for is also available: the variable HungarianOwned has the value one if the individual works for a fully-Hungarian owned company. An individual can work for a company owned exclusively (FullGovOwned) or partly (PartGovOwned) by the government. We have information on whether the individuals gained their foreign experience in European OECD countries (e.g., Austria, Denmark, England, Germany, Italy and Sweden), in non-European OECD countries (e.g., Australia, Canada, Japan and U.S.), or in non-OECD countries (e.g., Africa, Czech Republic, Poland, Romania, and Slovak Republic).

For each variable we test the null hypothesis that the mean for those who have been abroad is equal to the mean for those who have not been abroad. Using all observations, for both men and women, those who have been abroad have significantly more years of education and more of them lived in Budapest when they were 14 years old. Men who have been abroad are significantly older than men who have not been abroad.

Using the sample of those currently employed, for both men and women, those who have been abroad have significantly larger earnings than those who have not been abroad; further, those who have been abroad are more educated. A larger percentage of those who have been abroad are currently in Budapest (BudapestNow). Though not significant, men's work experience (actual years working) is larger for men who have been abroad. Women who have been abroad have less work experience than women who have not been abroad and this is statistically significant from the t-test. A larger percentage of men who have been abroad are employed in education-related occupations. Alternatively, a smaller percentage of men who have been abroad work in the utility sector and other industries (food, textile and other light industries); a smaller percentage of men who have abroad work for a fully-Hungarian owned business. For women's choice of industry, only heavy industry is significantly different in the percentage of women who have and have not been abroad: a smaller percentage of women who have been abroad work in heavy industries. Finally, relatively more women who have been abroad have received some form of training in the past year.

3. Econometric Issues and Models

Several issues need to be considered in estimating whether experience abroad provides a "premium" for people's earnings after returning to the home country. Our view is that the going abroad decision (migration) is an investment in human capital or "experience gathering." Re-migration to Hungary provides the migrant an opportunity to reap the benefits (if any) of experience abroad. Moreover, the size of the earnings "premium" may vary by the host country the return migrants have visited.[1]

[1]We would also like to consider how long the return migrants were working abroad and the year they returned. These would lead to varying periods of re-assimilation and we expect would influence the observed effect of experience abroad on earnings. Unfortunately, the data set does not contain this information. We also do not have information on individuals' prior to the time the migration/return

We consider a semi-log specification for the earnings equation,

$$Y = \mathbf{X}\boldsymbol{\beta} + \mathbf{D}\boldsymbol{\alpha} + e, \quad (1)$$

where Y is the natural-log of monthly earnings, β and α are coefficient vectors and e is stochastic term; matrix **X** includes variables on personal characteristics. Whether the person in currently living in Budapest or not is included to account for any earnings differential across locations. Typical human capital variables (education, training, and experience) are expected to raise earnings. We include the variable benefits to account for the possibility that earnings and additional job "quirks" are substitutes. A series of industry specific dummy variables are also included, with trade and personal services (e.g., financial services, tourism, etc.) as the reference category. Two dummy variables on employment status are included to test whether self-employed individuals or non-manual job workers have higher earnings than the manual job workers. We include two dummy variables related to firm characteristics: whether the firm the individual works for is wholly Hungarian owned or not (HungarianOwned), and whether firm is owned exclusively or partly by the government.

We capture the effects of foreign migration experience on earnings by introducing dummy variables on migration in Matrix **D**. In one specification, we have only one dummy variable capturing whether an individual has foreign work experience or not. In the other specification, we introduce three dummy variables to account for the host country: European OECD, non-European OECD, and non-OECD countries. The reference category in the two specifications is not having gone abroad. The coefficients for experience abroad are of great interest. If positive, then there is a premium to skills acquired abroad. On the other hand, a negative coefficient indicates that "skills" acquired abroad may be non-transferable, and that time away from the domestic labor market has hurt the worker.

The estimates of equation (1) from ordinary least square (OLS) may be inconsistent. The inconsistency occurs due to two selections: a working selection and a migration selection. The

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migration decision was made.

selection into working or not is a well-studied problem.[2] In addition, those who have been abroad may be more (or less) productive persons regardless of the foreign experience. The error term in the earnings equation is related to both the working decision and the migration decision. To address these selection issues, we introduce two index functions.

$$LFP^* = \mathbf{Z}\gamma + \upsilon \quad (2)$$

$$ABROAD^* = \mathbf{Q}\,\theta + \zeta \quad (3)$$

where γ and θ are vectors of coefficients and υ and ζ are stochastic terms.

Equations (2) and (3) are decision functions for working and migration respectively. LFP* and ABROAD* are unobservable. Nevertheless, we do observe the dichotomous variables LFP (LFP = 1 if LFP* > 0, and LFP = 0 otherwise) and ABROAD (ABROAD = 1 if ABROAD* > 0, and ABROAD = 0 otherwise).

The matrix **Z** includes, age, educational attainment, marital and family status. Age and its square term are included to test the notion that probability of work rises with age only up to a point, and then declines. Investments in formal education are made with expectations of higher future earnings, so higher levels of education should increase the probability of working. Marital and family status are also controlled for in the work status equation.

The matrix **Q** in the abroad equation above includes age, educational attainment and the locality in which an individual was raised. Younger individuals are more likely to go abroad and return migrate because they potentially have a longer life span during which to reap any returns from work experience abroad. More educated individuals may have lower moving costs since they can gather information on job availability, etc., much more efficiently (see Schwartz (1973)). Moreover, education may bring an opportunity to go abroad, earn a lot of money, and retire early after returning.

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[2]Correction for the bias that arises due to workers' self-selecting themselves into work is standard for women, but not for men. However, the men in our sample have a working rate of 55.09%, while the women have a working rate of 50.91%. This is very low for prime-aged males, and so considering the work decision for males here is appropriate.

Budapest at 14 is included to capture differences in the propensity to migrate and return migrate between those living in the capital.

The effects of decisions of participation and migration on earnings can be estimated using either two-step method with double selection ("Heckit") or maximum likelihood estimation (MLE). Heckit has been widely used when there is only one selection rule (see Heckman (1979)). Though we can extend Heckit to get 'consistent' estimators in the presence of double selection rules,[3] Heckit becomes very cumbersome when the number of selection rules is more than one. It is because the formulae for the computation of so-called lambdas become complicated and the burden of computing corrected standard error becomes enormous. The burden of computation can be relieved by assuming that two selections are not correlated (Fishe, Trost and Lurie (1981)). However, this is often too strong an assumption.

Recently, MLE has been found to be an attractive method when there are double selections (e.g., see Blank (1990)). The likelihood function is relatively simple when the stochastic terms are assumed to follow a multivariate normal distribution. We obtain consistent estimates by estimating the earnings equation and two selection equations simultaneously, eliminating the selection biases discussed above. The biases arise because OLS estimates earnings equation ignores the endogeneity of the participation and the migration decisions, where the participation and migration decisions are correlated with earnings. Estimating the earnings equation and two decision functions jointly accounts for the correlation (see Heckman (1978) and Moffitt (1983), p. 1030). The obtained estimators are not only consistent, but also have other desirable properties of MLE (they are asymptotically efficient and normally distributed).

The likelihood function is given as follows:[4]

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[3]See Fishe, Trost and Lurie (1981), Ham (1982), and Tunali (1986).
[4]The functional specification is given in the Appendix.

$$
\begin{aligned}
L = & \prod_{P,A} \Pr(\upsilon \geq -Z\gamma, \zeta \geq -Q\theta, e = Y - X\beta - \alpha D) \\
& \prod_{P,NA} \Pr(\upsilon \geq -Z\gamma, \zeta < -Q\theta, e = Y - X\beta) \\
& \prod_{NP,A} \Pr(\upsilon < -Z\gamma, \zeta \geq -Q\theta) \\
& \prod_{NP,NA} \Pr(\upsilon < -Z\gamma, \zeta < -Q\theta)
\end{aligned} \tag{4}
$$

where P, NP, A, and NA are labor market participant, labor market non-participant, individual has been abroad, and individual has never been abroad, respectively. The likelihood function shows the contribution of individuals who are working and have been abroad (P, A), individuals who are working and have never been abroad (P, NA), individuals who are not working and have been abroad (NP, A), and individuals who are not working and have never been abroad (NP, NA).

By maximizing the likelihood function, we can get estimators of the index functions (participation and migration decision functions, γ and θ), the earnings function (β and α), and variance and correlation coefficients.[5] The estimation is implemented using the SAS **N**on**L**inear **P**rogramming procedure (SAS Institute, 1997).

4. Analysis of Results

We run separate OLS for men and women and the results are presented in the first columns of Tables 2 and 3 respectively. The results indicate that men who have been abroad earn about 13.4% more than those who have not been abroad. Women earn 26.8% more.[6] However, the OLS estimates do not measure the true effect of migration on earnings because of the two self-selection

[5] For the identification purpose, the variance of υ and ζ are normalized to 1.

[6] These percentages are calculated following Kennedy's (1981) suggestion that the percentage change in semilog models when the independent variable is a dummy is exp[ß-.5 V(ß)] - 1, where ß is the estimated coefficient and V(ß) is the variance of ß. All dummy variable coefficients are converted using this formula and these values are used in the discussion.

issues we discussed in the previous section. We use maximum likelihood estimation to find the parameter estimates for the earnings equation. The MLE procedure also provides estimates for the coefficients of the two selection functions. These MLE are presented in columns 2 to 4 of Tables 2 and 3. Column 2 shows parameters of the earnings function, and columns 3 and 4 show coefficients for the labor market participation and going abroad choice equations.[7]

The estimates of the earnings equation using maximum likelihood with two selection mechanisms are different from those in OLS. For men, the effects of education and experience are smaller in the MLE, while the effects of education and experience for women are virtually not changed from OLS. Most significantly, the estimates for the going abroad variable are quite different from the OLS estimates for both men and women. However, the directions of the change are very interesting. For men, the MLE coefficient is smaller than the OLS coefficient (the MLE is not statistically significant). This is the typical pattern when the selection correction makes a difference. MLE shows that the positive effects of going abroad on earnings in the OLS reflect the effect of self-selection into going abroad. This may be due to unmeasurable personal factors that make re-migrant workers' productivity higher (consequently earnings are larger). The finding implies that those who have been abroad would earn higher earnings even if they have not been abroad.

For women, the MLE coefficient is larger than the OLS coefficient (suggesting a negative bias). This is atypical of the standard results when self-selection is taken into account. The implication of the underestimation of the OLS coefficient is that unobservable personal characteristics increase a woman's probability of going abroad but these unobservable characteristics make them less desirable in Hungary (so they command lower pay). When these unobservable characteristics are taken into account, we get the larger "true" effect of going abroad on earnings. For example, certain "attitudes"

[7] The MLE results are very robust. We estimate the models with (presented in this paper) and without industry dummy variables for full sample, and with/without industry dummy variables for only wage-salary earners. We also estimate these models for aged 25 or more to avoid the effects of education decision. The results of these tests can be obtained from the authors upon request.

may increase the probability of going abroad but may make a woman less desirable in the workplace in Hungary (and this translates to lower average earnings). It could be that the workplace rewards women with these "attitudes" only if these women have been abroad (for example, by opening certain jobs that are closed to women who have not gone abroad). The earnings premium for women is not only statistically significant at the 1% level but the coefficient is economically large. Female return migrants earn a premium of 45%.

Regarding the other coefficient estimates using maximum likelihood estimation, both men and women currently living in Budapest earn at least 17% more than those in other locations; for each additional year of education, earnings is about 5% higher and each additional year of experience translates to a 1% premium, *ceteris paribus*. Not surprisingly, men in construction earn 34% more than those in the base industry trade and personal services (e.g., financial services and tourism, etc.); those in utilities and heavy industries earn 17% more. Those in other industries (e.g., food, textile, and other light industries) earn 13% more. On the other hand, women in health, school and state related services earn significantly less than those in trade and personal services. The effects range from 10% to 16%. Everything else the same, those working for wholly Hungarian owned firms earn significantly less-- men by 30% and women by 27%.

The significant difference in the premium for working abroad between men (4%) and women (45%) could be attributed to host country specific effects. Instead of using a binary variable for experience abroad, we differentiate the host countries by introducing three dummy variables for host "regions."[8] These results are in Tables 4 and 5. Since men and women differ in the regions that they go to, there is reason to believe that the motivations for going abroad differ between men and women. From the MLE estimates, we find that men who have been to other OECD countries earn a premium

[8] We could not estimate the choice functions for each of the different host regions due to data limitations. Instead, we use the same zero/one abroad equation in conjunction with the participation choice equation but include regional dummy variables in the earnings equation.

of about 46% over those who have not been abroad; other host "regions" do not result in statistically significant premiums. Women who have been to OECD countries earn a premium over those who have not been abroad. What is most interesting is that the earnings premium for women differs substantially according to host "regions." Those who went to European OECD countries (such as Germany) earn a premium of about 42% and those who went to other OECD countries (such as U.S.) earn a premium of about 118%. What these results show is that foreign experience earns a premium in the Hungarian labor market; further, the size of the premium is host "region" specific. Finally, the coefficients for the other variables are similar to those when host countries are not differentiated.

5. Conclusion

We address the issue of human capital acquisition by return migrants in host countries, asking what difference working abroad makes to the earnings of those return migrants who enter the labor force once back in Hungary. Using the Hungarian Household Panel Survey, we find there are large differences in the human capital returns to foreign experience across gender and among host countries in which the human capital was acquired. Two distinct selection issues are considered in the estimation of the earnings equation. Rather than using the standard two stage technique, we implement a maximum likelihood estimation. MLE is less cumbersome to implement and more flexible, and allows us jointly to account for our two selection issues and our earnings estimation.

Appendix

The stochastic terms (υ, ζ, e) follow a joint normal distribution with mean zero and the following variance-covariance matrix:

$$\Sigma = \begin{bmatrix} \sigma_{\upsilon}^2 & \sigma_{\upsilon\zeta} & \sigma_{\upsilon e} \\ & \sigma_{\zeta}^2 & \sigma_{\zeta e} \\ & & \sigma_e^2 \end{bmatrix},$$

where σ_{υ}^2 and σ_{ζ}^2 are normalized to 1.

The likelihood function for non-participants is simply the bivariate distribution of υ and ζ with correlation coefficient $\rho_{\upsilon\zeta}$. For participants, the likelihood function can be factored into the conditional distribution of υ and ζ given *e*, and marginal density of *e*. Conditional means of υ and ζ given *e* are denoted as $\mu_{\upsilon|e}$ and $\mu_{\zeta|e}$ respectively, and computed as follows:

$$\mu_{\upsilon|e} = \rho_{\upsilon e}\frac{\sigma_{\upsilon}}{\sigma_e}e, \text{ and}$$

$$\mu_{\zeta|e} = \rho_{\zeta e}\frac{\sigma_{\zeta}}{\sigma_e}e,$$

where $\rho_{\upsilon e}$ and $\rho_{\zeta e}$ are correlation coefficients between υ and *e*, and between ζ and *e*.

The conditional variance and covariance of υ and ζ given *e* are denoted as $\sigma_{\upsilon|e}^2$, $\sigma_{\zeta|e}^2$ and $\sigma_{\upsilon\zeta|e}$ respectively. The correlation coefficient between υ and ζ conditional on *e* is denoted as $\rho_{\upsilon\zeta|e}$. They are computed as follows:

$$\sigma_{\upsilon|e}^2 = \sigma_{\upsilon}^2\left(1-\rho_{\upsilon e}^2\right),$$

$$\sigma_{\zeta|e}^2 = \sigma_{\zeta}^2\left(1-\rho_{\zeta e}^2\right),$$

$$\sigma_{\upsilon\zeta|e} = \left(\rho_{\upsilon\zeta}-\rho_{\upsilon e}\rho_{\zeta e}\right)\sigma_{\upsilon}\sigma_{\zeta}, \text{ and}$$

$$\rho_{\upsilon\zeta|e} = \frac{\sigma_{\upsilon\zeta|e}}{\sigma_{\upsilon|e}\sigma_{\zeta|e}}.$$

The likelihood function is given as follows:

$$
\begin{aligned}
L = & \prod_{\mathrm{P,A}} \Psi\left(\frac{\mathrm{Z}\gamma + \mu_{\upsilon|e}}{\sigma_{\upsilon|e}}, \frac{\mathrm{Q}\theta + \mu_{\zeta|e}}{\sigma_{\zeta|e}}, \rho_{\upsilon\zeta|e}\right) \cdot \frac{1}{\sigma_e} \cdot \phi\left(\frac{\mathrm{Y} - \mathrm{X}\beta - \alpha\mathrm{D}}{\sigma_e}\right) \\
& \prod_{\mathrm{P,NA}} \Psi\left(\frac{\mathrm{Z}\gamma + \mu_{\upsilon|e}}{\sigma_{\upsilon|e}}, -\frac{\mathrm{Q}\theta + \mu_{\zeta|e}}{\sigma_{\zeta|e}}, -\rho_{\upsilon\zeta|e}\right) \cdot \frac{1}{\sigma_e} \cdot \phi\left(\frac{\mathrm{Y} - \mathrm{X}\beta}{\sigma_e}\right) \\
& \prod_{\mathrm{NP,A}} \Psi\left(-\frac{\mathrm{Z}\gamma}{\sigma_\upsilon}, \frac{\mathrm{Q}\theta}{\sigma_\zeta}, -\rho_{\upsilon\zeta}\right) \\
& \prod_{\mathrm{NP,NA}} \Psi\left(-\frac{\mathrm{Z}\gamma}{\sigma_\upsilon}, -\frac{\mathrm{Q}\theta}{\sigma_\zeta}, \rho_{\upsilon\zeta}\right)
\end{aligned}
\qquad (4')
$$

where φ and Ψ are the standard univariate normal density and the standard bivariate normal distribution function.

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Table 1. Average Values of the Variables

Variables	Men		Women	
	Not Been Abroad	Been Abroad	Not Been Abroad	Been Abroad
Sample Size, all observations	1475	117	1650	55
Age	37.18	41.24*	38.53	37.11
Education	9.342	10.73*	9.418	12.11*
Marital Status	0.611	0.735*	0.632	0.618
Family Status	0.662	0.812*	0.197	0.309**
Budapest at 14	0.085	0.256*	0.102	0.236**
% working	53.97	69.23*	50.30	69.09*
Sample Size, those working	796	81	830	38
Age	37.70	40.62*	37.81	38.00
Education	10.06	11.10*	10.15	12.53*
Marital Status	0.719	0.802	0.655	0.684
Family Status	0.802	0.852	0.230	0.342
Budapest at 14	0.108	0.284*	0.136	0.211
Natural Log Monthly Earnings	9.703	9.978*	9.452	9.871*
BudapestNow	0.163	0.272**	0.202	0.395*
Years working	20.62	22.38	20.40	16.79**
Benefits	0.563	0.593	0.590	0.658
Training	0.097	0.136	0.117	0.316**
Heavy Industry	0.323	0.383	0.236	0.053*
Construction	0.070	0.136	0.020	-
Other Industries	0.116	0.037*	0.181	0.132
Utilities	0.099	0.037*	0.051	0.053
Health	0.029	0.025	0.105	0.211
School	0.038	0.111**	0.133	0.211
State	0.035	0.049	0.034	0.026
Other services	0.092	0.074	0.039	0.105
Trade	0.102	0.086	0.164	0.184
Agriculture	0.097	0.062	0.039	0.026
Self-employed	0.117	0.099	0.061	0.026
Non-manual	0.333	0.407	0.518	0.737*
FullGovOwned	0.361	0.346	0.454	0.526
PartGovOwned	0.153	0.148	0.163	0.079
HungarianOwned Firm	0.972	0.889**	0.978	0.921
OECD-European	-	0.605	-	0.237
OECD-NonEuropean	-	0.012	-	0.158
Non-OECD countries	-	0.383	-	0.605

Note: For both males and females, the null hypothesis tested is that the mean of those been abroad is equal to that of those who have not been abroad. * and ** imply that the null is rejected at the 1% and 5% level of significance, respectively.

Table 2. Effects of Migration on Earnings, Men

	OLS		MLE					
	Log Earnings		Log Earnings		Choice of Labor Market Participation		Choice of Migration	
Constant	8.989*	(0.133)	9.267*	(0.147)	-3.253*	(0.364)	-2.760*	(0.224)
Age					0.117*	(0.021)	0.014*	(0.003)
$Age^2/100$					-0.173*	(0.026)		
Marital Status					0.236*	(0.091)		
Family Status					0.747*	(0.103)		
Budapest at 14							0.541*	(0.136)
BudapestNow	0.180*	(0.042)	0.185*	(0.045)				
Education	0.060*	(0.007)	0.051*	(0.009)	0.111*	(0.013)	0.070*	(0.018)
Years working	0.020*	(0.005)	0.011***	(0.006)				
$Yrswrk^2/100$	-0.031*	(0.012)	-0.008	(0.013)				
Benefits	0.017	(0.039)	0.015	(0.041)				
Training	0.050	(0.055)	0.043	(0.040)				
Heavy Industry	0.157*	(0.060)	0.156**		(0.063)			
Construction	0.297*	(0.075)	0.297*	(0.081)				
Other Industries	0.129***	(0.070)	0.125***	(0.067)				
Utilities	0.166*	(0.073)	0.163**		(0.078)			
Health	-0.104	(0.107)	-0.094	(0.086)				
School	-0.073	(0.094)	-0.066	(0.099)				
State	-0.000	(0.097)	0.000	(0.083)				
Other services	0.131***	(0.070)	0.126	(0.082)				
Agriculture	-0.039	(0.071)	-0.041	(0.068)				
Self-employed	0.051	(0.067)	0.045	(0.091)				
Non-manual	0.125*	(0.045)	0.125*	(0.045)				
HungarianOwned	-0.357*	(0.086)	-0.361*		(0.091)			
FullGovOwned	0.011	(0.040)	0.011	(0.039)				
PartGovOwned	0.078	(0.048)	0.075***	(0.045)				
Abroad	0.127**	(0.054)	0.045	(0.088)				
σ_e			0.458*	(0.024)				
ρ_{ve}			-0.366*	(0.079)				
$\rho_{\zeta e}$			0.091**	(0.045)				
$\rho_{v\zeta}$			0.057	(0.072)				
Adj. R^2	0.239							
F-stat	14.068							
N	877					1592		

Note: The numbers in parentheses are the standard errors.

*, ** and *** mean statistically significant at 1%, 5% and 10% respectively.

Table 3. Effects of Migration on Earnings, Women

	OLS		MLE					
	Log Earnings		Log Earnings		Choice of Labor Market Participation		Choice of Migration	
Constant	8.892*	(0.114)	8.895*	(0.184)	-5.328*	(0.366)	-3.076*	(0.348)
Age					0.267*	(0.021)	-0.002	(0.005)
$Age^2/100$					-0.353*	(0.026)		
Marital Status					-0.070	(0.093)		
Family Status					0.288*	(0.103)		
Budapest at 14							0.221	(0.164)
BudapestNow	0.158*	(0.033)	0.157*	(0.033)				
Education	0.052*	(0.006)	0.050*	(0.008)	0.086*	(0.011)	0.120*	(0.025)
Years working	0.014*	(0.005)	0.014**		(0.006)			
$Yrswrk^2/100$	-0.017	(0.011)	-0.017	(0.014)				
Benefits	0.070**	(0.032)	0.070**		(0.031)			
Training	0.050	(0.042)	0.050	(0.043)				
Heavy Industry	-0.018	(0.046)	-0.019	(0.047)				
Construction	-0.055	(0.098)	-0.055	(0.094)				
Other Industries	-0.054	(0.045)	-0.055	(0.043)				
Utilities	-0.083	(0.067)	-0.083		(0.069)			
Health	-0.104***	(0.055)	-0.105**		(0.048)			
School	-0.103***	(0.054)	-0.105**		(0.051)			
State	-0.171**	(0.080)	-0.171**		(0.082)			
Other services	-0.080	(0.070)	-0.079	(0.097)				
Agriculture	0.054	(0.074)	0.055	(0.091)				
Self-employed	0.024	(0.063)	0.025	(0.084)				
Non-manual	0.198*	(0.032)	0.198*	(0.033)				
HungarianOwned	-0.314*	(0.085)	-0.315*		(0.098)			
FullGovOwned	-0.018	(0.035)	-0.018	(0.036)				
PartGovOwned	0.113*	(0.040)	0.113*		(0.042)			
Abroad	0.240*	(0.064)	0.375*		(0.090)			
σ_e			0.369*		(0.015)			
ρ_{ve}			0.011		(0.154)			
$\rho_{\zeta e}$			-0.168***		(0.096)			
$\rho_{v\zeta}$			0.034		(0.087)			
Adj. R^2	0.328							
F-stat	21.145							
N	868					1705		

Note: The numbers in parentheses are the standard errors.

*, ** and *** mean statistically significant at 1%, 5% and 10% respectively.

Table 4. Effects of Migration on Earnings, Men with Host Countries

	OLS		MLE					
	Log Earnings		Log Earnings		Choice of Labor Market Participation		Choice of Migration	
Constant	8.991*	(0.134)	9.274*	(0.147)	-3.252*	(0.364)	-2.760*	(0.224)
Age					0.117*	(0.021)	0.014*	(0.003)
$Age^2/100$					-0.173*	(0.026)		
Marital Status					0.236*	(0.090)		
Family Status					0.748*	(0.103)		
Budapest at 14							0.542*	(0.136)
BudapestNow	0.180*	(0.042)	0.185*	(0.046)				
Education	0.060*	(0.007)	0.050*	(0.009)	0.111*	(0.013)	0.070*	(0.018)
Years working	0.020*	(0.005)	0.010***	(0.006)				
$Yrswrk^2/100$	-0.030**	(0.012)	-0.007	(0.013)				
Benefits	0.016	(0.039)	0.015	(0.041)				
Training	0.049	(0.055)	0.041	(0.040)				
Heavy Industry	0.154*	(0.060)	0.154**		(0.063)			
Construction	0.296*	(0.075)	0.295*	(0.080)				
Other Industries	0.129***	(0.070)	0.125***	(0.067)				
Utilities	0.167**	(0.074)	0.164**		(0.078)			
Health	-0.101	(0.107)	-0.091	(0.086)				
School	-0.072	(0.094)	-0.065	(0.099)				
State	0.011	(0.098)	0.013	(0.083)				
Other services	0.133***	(0.070)	0.129	(0.083)				
Agriculture	-0.036	(0.071)	-0.037	(0.066)				
Self-employed	0.049	(0.067)	0.044	(0.092)				
Non-manual	0.125*	(0.045)	0.125*	(0.045)				
HungarianOwned	-0.354*	(0.086)	-0.358*		(0.091)			
FullGovOwned	0.010	(0.040)	0.011	(0.039)				
PartGovOwned	0.081***	(0.048)	0.079***	(0.044)				
OECD-European	0.171**	(0.068)	0.094	(0.110)				
OECD-NonEuropean	0.449	(0.455)	0.384*		(0.073)			
Non-OECD countries	0.050	(0.083)	-0.046		(0.125)			
σ_e			0.458*		(0.024)			
ρ_{ve}			-0.372*		(0.079)			
$\rho_{\zeta e}$			0.093**		(0.047)			
$\rho_{v\zeta}$			0.057		(0.072)			
Adj. R^2	0.238							
F-stat	12.923							
N	877					1592		

Note: The numbers in parentheses are the standard errors.

*, ** and *** mean statistically significant at 1%, 5% and 10% respectively.

Table 5. Effects of Migration on Earnings, Women with Host Countries

	OLS		MLE					
	Log Earnings		Log Earnings		Choice of Labor Market Participation		Choice of Migration	
Constant	8.914*	(0.114)	8.920*	(0.177)	-5.329*	(0.366)	-3.058*	(0.344)
Age					0.267*	(0.021)	-0.002	(0.005)
$Age^2/100$					-0.353*	(0.026)		
Marital Status					-0.071	(0.093)		
Family Status					0.288*	(0.103)		
Budapest at 14							0.208	(0.162)
BudapestNow	0.150*	(0.033)	0.149*	(0.032)				
Education	0.050*	(0.006)	0.049*	(0.007)	0.086*	(0.011)	0.119*	(0.025)
Years working	0.015*	(0.005)	0.015**		(0.006)			
$Yrswrk^2/100$	-0.018***	(0.011)	-0.018		(0.014)			
Benefits	0.076**	(0.032)	0.076**		(0.031)			
Training	0.061	(0.043)	0.061	(0.045)				
Heavy Industry	-0.015	(0.045)	-0.016	(0.047)				
Construction	-0.046	(0.098)	-0.046	(0.094)				
Other Industries	-0.049	(0.045)	-0.050	(0.044)				
Utilities	-0.075	(0.066)	-0.075		(0.069)			
Health	-0.109**	(0.055)	-0.110**		(0.048)			
School	-0.102***	(0.054)	-0.103**		(0.051)			
State	-0.166**	(0.079)	-0.166**		(0.082)			
Other services	-0.085	(0.070)	-0.085	(0.091)				
Agriculture	0.061	(0.073)	0.062	(0.090)				
Self-employed	0.034	(0.063)	0.034	(0.085)				
Non-manual	0.195*	(0.032)	0.195*	(0.033)				
HungarianOwned	-0.330*	(0.085)	-0.331*		(0.098)			
FullGovOwned	-0.010	(0.035)	-0.010	(0.036)				
PartGovOwned	0.113*	(0.040)	0.113*		(0.041)			
OECD-European	0.277**	(0.127)	0.364**		(0.141)			
OECD-NonEuropean	0.739*	(0.156)	0.817*	(0.278)				
Non-OECD countries	0.102	(0.080)	0.193	(0.124)				
σ_e			0.365*	(0.014)				
ρ_{ve}			-0.000	(0.153)				
$\rho_{\zeta e}$			-0.111	(0.153)				
$\rho_{v\zeta}$			0.035	(0.088)				
Adj. R^2	0.337							
F-stat	20.169							
N	868					1705		

Note: The numbers in parentheses are the standard errors.

*, ** and *** mean statistically significant at 1%, 5% and 10% respectively.