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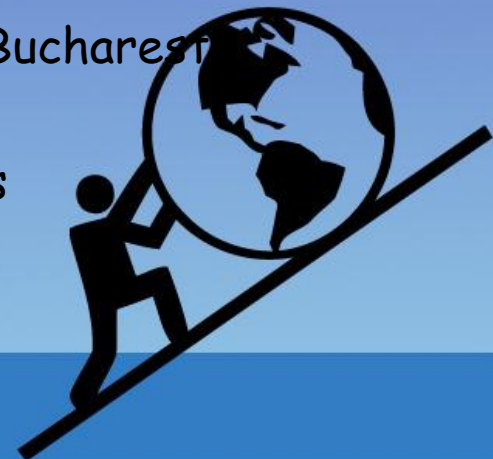
Profile of Migrants in Romania - a Statistical Analysis Using R

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Context of the scientific approach

- Economic crisis - important factor for migration
- LFS 2007 and LFS 2011
- 3186 groups (localities)
- Explanatory variables: sex, age group, residence area, education level, activity, marital status



Logistic regression (logit)

$$\log \frac{p_i}{1-p_i} = \beta_0 + \beta_1 X_1 + \dots + \beta_i X_i$$

- Categorical effect - migrant/non-migrant state of person
- $y_i = 1$ if the person is absent from home for more than 12 months
- $y_i = 0$ otherwise



Logit model in R

- `glm(formula = absent ~ gender, family = "binomial", data = migr)`
- `glm(formula = absent ~ age, family = "binomial", data = migr)`
- `glm(formula = absent ~ residence_area, family = "binomial", data = migr)`
- `glm(formula = absent ~ edu_level, family = "binomial", data = migr)`
- `glm(formula = absent ~ activity, family = "binomial", data = migr)`
- `glm(formula = absent ~ marital_status, family = "binomial", data = migr)`



Logit model output in R

```
> summary(mylogit)

Call:
glm(formula = absent ~ activ, family = "binomial", data = migr)

Deviance Residuals:
    Min       1Q   Median       3Q      Max
-0.67685 -0.00003 -0.00003 -0.00003  3.00527

Coefficients:
              Estimate Std. Error z value Pr(>|z|)
(Intercept)   -1.35703    0.01770  -76.662  <2e-16 ***
activelev/student -3.14779    0.09202  -34.209  <2e-16 ***
activocupat  -20.20904   130.85712   -0.154    0.877
activpensionar -20.20904   168.18315   -0.120    0.904
activsomer    -20.20904   424.14879   -0.048    0.962
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

    Null deviance: 35693  on 115806  degrees of freedom
Residual deviance: 21238  on 115802  degrees of freedom
AIC: 21248

Number of Fisher Scoring iterations: 20
```



Odds ratio and CI output in R

```
> exp(cbind(coef(mylogit), confint(mylogit)))  
waiting for profiling to be done...  
                2.5 %      97.5 %  
(Intercept) 0.02422063 0.02297191 0.02551486  
sexm        2.12184690 1.98838817 2.26519411
```



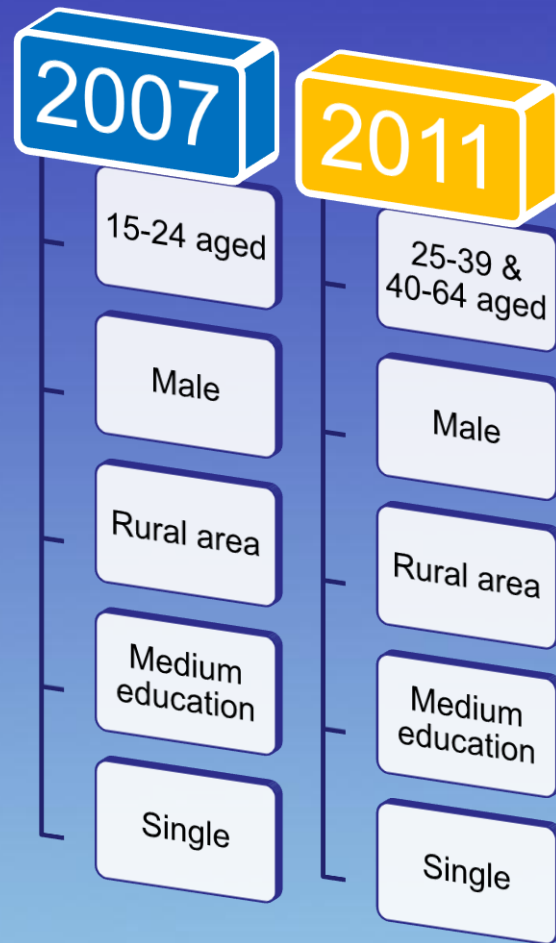
Migrants' profile before crisis (2007)

<i>Covariates of the model</i>	<i>Odds Ratio</i>	<i>Confidence Interval</i>		<i>p-value</i>
		<i>Lower 95%</i>	<i>Upper 95%</i>	
Age (ref – gr_1)				
gr_2	18.53	2.65	3.21	< 2e-16 ***
gr_3	15.85	2.49	3.05	< 2e-16 ***
gr_4	5.62	1.45	2.01	< 2e-16 ***
gr_5	0.08	-3.23	-1.84	4.38e-13 ***
Gender (ref – female)				
male	2.12	0.68	0.81	< 2e-16 ***
Residence area (ref – rural)				
urban	1.14	0.07	0.19	1.58e-05 ***
Education level (ref – medium)				
low level	0.56	-0.63	-0.50	< 2e-16 ***
high level	0.51	-0.79	-0.51	< 2e-16 ***
Activity (ref - other situations)				
pupil/student	0.04	-3.33	-2.97	< 2e-16 ***
employed	0.00	-178.16	-170.71	0.877
pensioner	0.00	-223.25	-213.71	0.904
unemployed	0.00	-532.18	-508.05	0.962
Marital status (ref – married)				
single	1.94	1.82	2.07	< 2e-16 ***
widow/divorced	0.25	0.22	0.30	< 2e-16 ***

Migrants' profile after crisis (2011)

<i>Covariates of the model</i>	<i>Odds Ratio</i>	<i>Confidence Interval</i>		<i>p-value</i>
		<i>Lower 95%</i>	<i>Upper 95%</i>	
Age (ref – gr_1)				
gr_2	12.33	2.13	2.93	< 2e-16 ***
gr_3	13.64	2.24	3.02	< 2e-16 ***
gr_4	5.25	1.28	2.07	< 2e-16 ***
gr_5	0.12	-2.82	-1.34	3.93e-08 ***
Gender (ref – female)				
male	1.74	1.59	1.90	< 2e-16 ***
Residence area (ref – rural)				
urban	0.74	0.68	0.82	5.18e-10 ***
Education level (ref – medium)				
low level	0.61	0.55	0.67	< 2e-16 ***
high level	0.62	0.52	0.74	1.4e-07 ***
Activity (ref – other situations)				
pupil/student	-3.73e-02	-3.57	-3.02	< 2e-16 ***
employed	-3.51e-09	-162.28	-139.16	0.885
pensioner	-3.51e-09	-190.85	-163.33	0.904
unemployed	-3.51e-09	-451.55	-381.60	0.962
Marital status (ref – married)				
single	2.00	1.83	2.19	< 2e-16 ***
widow/divorced	0.38	0.32	0.46	< 2e-16 ***

Profile of migrant 2007 vs. 2011



Thank you!

If you would like to join Romanian team, please
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www.r-project.ro

