THE IMPACT OF THE SELECTED SOCIOECONOMIC FACTORS ON THE INTERNATIONAL MIGRATION IN EU

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Abstract

The main aim of the paper is to analyse an impact of the selected socioeconomic factors on the international migration in the European Union through exploitation of the gross migration rate (GMI). From the results of the analysis is obvious that people tend to migrate from countries with lower GDP into the countries with higher GDP within the European Union. From the results is also obvious that there is statistically significant correlation between Human development index (HDI) and GMI. Therefore we can state that HDI affects the migration flows within the EU27 and that people tend to migrate from countries with lower index of income into the countries with higher index of income and that there is a correlation also between GMI and other indicators of HDI.

Key words gross migration rate, HDI, path analysis

JEL Code: F 22, O 15

Introduction

Migration isn't anything new, as it affects as countries of origin so destination countries for ages, even though it is still actual topic as evidenced by the number of expert research papers and other publications. For example, Abel (2010) in his paper developed new methodology to estimate comparable international migration flows between a set of countries. Abel also presents a complete table of comparable flows which can be used by regional policy makers and social scientists to understand population behaviour and change better. The next author that examine EU migration policy is Van Riemsdijk (2012) who in her article underline that EU create a common EU migration policy since the mid- 1980s and her paper provides a short historical overview of initiatives of the European Commission to streamline migration policies across the EU, followed by a case study of the (re)scaling of the European Blue Card at first. Adepoju, Woorloos and Zoomers (2010) observe that the two past decades have seen the steady emergence of various bilateral and multilateral migration agreements between

Europe and migrant-sending countries in the global South. Geddes (2005) in his article explores the impact of the changed border relationship within and between EU Member States on the increasingly important external dimension of migration and asylum policy. Predictions of the level of migration form Central and Eastern European countries which joined the EU in 2004 evaluate Bahna (2008). It is very important that Bahna (2008) demonstrated that well-chosen survey variables have the potential to provide accurate measurement of migration intentions. Hierro, Maza and Villaverde (2012) analysed the EU´s international migration distribution (EUIMD) for period 1990-2010 with focus on trends in polarization and in exploring some key factors that might by behind this trends. The result is that polarization in EUIMD has followed a decreasing path and that factors like geographic location and government expenditure on the health are those which better explain the polarization phenomenon.

Whereas there is a correlation between HDI and GMI in the EU27 member countries, we have been interested in the deeper reasons of this correlation and hence we have chosen the path analysis that makes it possible.

1. Materials and methods

The International migration is in the terminology of International Organization for Migration (IOM) defined as *"movement of persons who leave their country of origin, or the country of habitual residence, to establish themselves either permanently or temporarily in another country."*[1] It is obvious that there is not assigned the purpose of the movement or its duration. The core of this definition is in the movement of persons across the international frontiers.

We can analyse the migration from the different point of views, e.g. from economic, demographic, pedagogical, political or social and in each case we could reach some interesting results. In this paper we will analyse the impact of selected socioeconomic factors on the international migration. These are factors which motivate persons to emigrate from their home country to new destination country - positive pull factors and on the other hand, that are negative factors which motivate persons to leave their home country, from this perspective that are push factors. Although among authors dominate opinions that the main factors of migration have economical character, they demonstrate that the other factors that

[1]Perruchoud, R. – Redpath-Cross, J., etc. Glossary on Migration, 2nd edition. International Organization for Migration 2011: 51.

influence migration of persons have socioeconomic character, e.g. education, income, current job position, social networks and family relationship, etc. (Štefančík, 2010)

Our examination is based on monitoring of available literature, as research studies, expert literature form internet sources, on information published on the websites of relevant institutions, or organisations and their programmes, e.g. International Organization for Migration (IOM), United Nations development programme (UNDP). We have worked also with homogenous statistical information from one source.

In this paper we will analyse an impact of the selected socioeconomic factors on the international migration in the European Union through exploitation of the gross migration rate (GMI). GMI is total volume of population turnover, in other words, it is the sum of all people who enter and leave an area. We will analyse the correlation between GMI and Human development index (HDI).

HDI consist of three basic dimensions – health, education and living standards to which belong these four indicators: *life expectancy at birth (health – mark: LEI), many years of schooling and expected years of schooling (education – mark: EI) and gross national income per capita (living standards – mark: II)*[2], therefore we will try to explore also direct and indirect correlation among indicator of HDI and GMI.

1.1 Human development index formula

HDI is a composite statistic which was introduced in first Human Development Report (HDR) in 1990. HDI helps to analyse the human development around the world. The values of index are from interval <0, 1> and 1 is the best value. The HDI had been defined as a simple arithmetic average of normalized indices until 2010. It is necessary to underline that UNDP use quite new methodology since year 2011. In this year were introduced new HDI formula and the first difference between the old and new is that it is no longer the arithmetic, but geometric average of normalized indices. The other change is that the upper and lower bounds used to normalize the index were redefined. That will eliminate the practice of capping variables that surpass the upper bounds.[3]

The new HDI formula is:

[2]UNDP. Human Development Index. Human development report. 13 January 2012. 15 June 2012 <http://hdr.undp.org/en/statistics/hdi/>

[3]For more detailed explanation of new HDI formula and for formulas of partial calculations see Klugman, J. – Rodríguez, F. – Choi, H-J. The HDI 2010: New Controversies, Old critiques. Human Development Research Papers April 2011: 1-45.

$$HDI = (H_{Health} \quad H_{Education} \quad H_{Living\ standard})^{1/3} \tag{1}$$

1.2 Path analysis

Path analysis (PA) is extensions of multiple regressions that allow us examine more than one dependent variable at a time. Its advantage is that examined variables can be dependent in relation to some variables and independent in relation to others. The visualization of PA is called path diagram which visualize the direct and indirect impact of each independent variable and direct impact of unknown factor on the examine dependent variable/variables.

A key element of the path analysis is Pearson correlation coefficient which represents linear dependence rate. The very calculation of path analysis is as follows (Moses, 2006).

Let k is the number of factors X, Y is the analysed dependent variable, r_{ij} (i, j = 1,2, ..., k) are the Pearson correlation coefficients between the factors X_i and X_j and r_iY (i = 1, 2, ... , k) is the Pearson correlation coefficient between the factors X_i and Y. The path coefficients p_iY (i = 1, 2, ..., k) are calculated through these linear equations:

$$\begin{pmatrix} 1 & r_{12} & \cdots & r_{1k} \\ \vdots & & \ddots & \vdots \\ r_{k1} & r_{k2} & \cdots & 1 \end{pmatrix} \begin{pmatrix} p_{1Y} \\ \cdots \\ p_{kY} \end{pmatrix} = \begin{pmatrix} r_{1Y} \\ \cdots \\ r_{kY} \end{pmatrix} \tag{2}$$

Path coefficient is sometimes referred as direct effect.

Path coefficient factor U (the unknown factor), which is not included in the model, is calculated as follows:

$$p_{UY} = \sqrt{1 - \sum_{i=1}^{k} r_{iY} p_{iY}} \tag{3}$$

Indirect impact of factor X_i through factor X_j on the variable Y is calculated according to this relation:

$$r_{ij} p_{jY} \ (i, j = 1, 2, \ldots, k) \tag{4}$$

The overall effect of T of all factors X that directly affect the variable Y is:

$$T = \sum_{i=1}^{k} r_{iY} p_{iY} \tag{5}$$

The statistical significance of the T value can be estimated according to this statistics f:

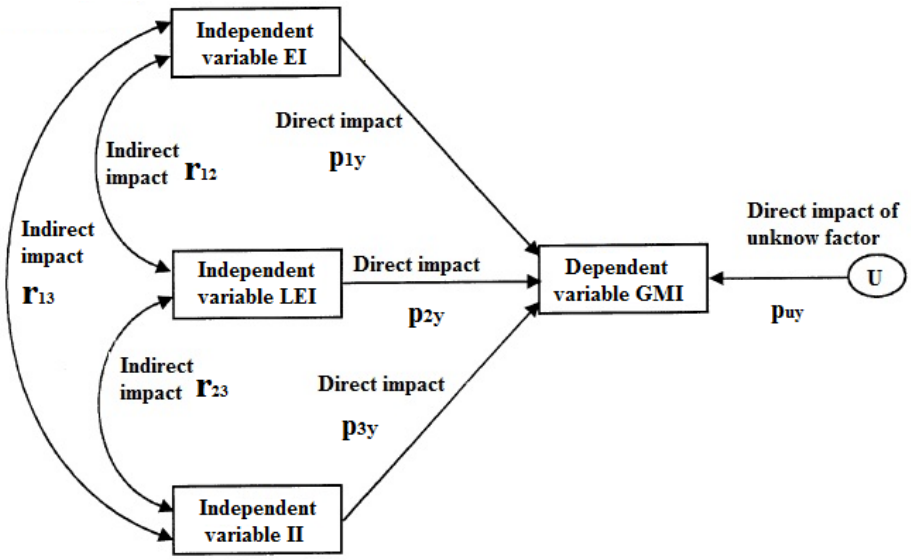
$$f = T(N-k-1)/(1-T) \tag{6}$$

where N is the sample size. The Statistics f is compared with critical value of Fischer distribution F_α (k, N-k-1). If the value f is greater than the critical value F_α (k, N-k-1), then the impact on the examined variables Y, is significant at the significance level α.

2. Results and discussion

The main aim of this part is to present our results. In the figure 1 we can see path diagram from witch is obvious that it consists of straight arrows – paths and curved arrows which represent the correlation among variables. We examine one dependent variable GMI and three independent variables EI, LEI and II. U is the unknown factor with direct impact on the dependent variable GMI.

Fig. 1: Path diagram



Source: own processing.

In our analysis we start from correlation matrix which is presented in table 1 below.

Tab. 1: Correlation coefficients

	EI	LEI	II	HDI	GMI
EI	1.000	0.080	0.192	0.572	-0.351
LEI	0.080	1.000	0.838	0.826	0.587
II	0.192	0.838	1.000	0.886	0.546
HDI	0.572	0.826	0.886	1.000	0.328
GMI	-0.351	0.587	0.546	0.328	1.000

Source: own processing.

Hypothesis H_0: $\varrho = 0$, assume, that the exanimated variables (HDI and GMI) are independent to the intent that, there is not linear correlation between these variables.

Correlation $\mathbf{r}_{HDI,\ GMI} = 0.3279$. P value = 0.0475 < 0.05. P value is the lowest level of significance. As P value is smallest, than chosen level of significance, in our case it is 0.05, we can consider the intensity of correlation as statistically significant and therefore we can

disapprove the hypothesis H_0: $\varrho = 0$. Using formulas (2)-(6) we obtain the next results. Remark that in our analysis k = 3, as we analyzed three factors: EI, LEI and II.

Tab. 2: Results of path analysis for EI, LEI and II

Impact	Calculation	Value
Direct impact EI to GMI		-0.4475
Indirect impact EI through LEI to GMI	0.08*0.313	0.0251
Indirect impact EI through II to GMI	0.19*0.369	0.0709
Correlation coefficient between EI and GMI		-0.35142 (P value = 0. 0361)*
Direct impact LEI to GMI		0.3135
Indirect impact LEI through EI to GMI	0.08*(-0.447)	-0.0358
Indirect impact LEI through II to GMI	0.83*0.369	0.3095
Correlation coefficient between LEI and GMI		0.587206 (P value = 0.0006)*
Direct impact II to GMI		0.3692
Indirect impact II through LEI to GMI	0.83*0.313	0.2629
Indirect impact II through EI to GMI	0.19*(-0.447)	-0.0861
Correlation coefficient between II and GMI		0.54598 (P value = 0.0016)*
Total effect T of all factors (EI, LEI and II)		0.5429
Effect of unknown factor U		0.6761

Source: own processing.
*Data for P values are from Statistic calculators from www.danielsoper.com
*To calculate the final value, we used values with full amount of decimal places. The values which are in the column "calculation" are rounded numbers and therefore final and partial calculations completely do not fit.

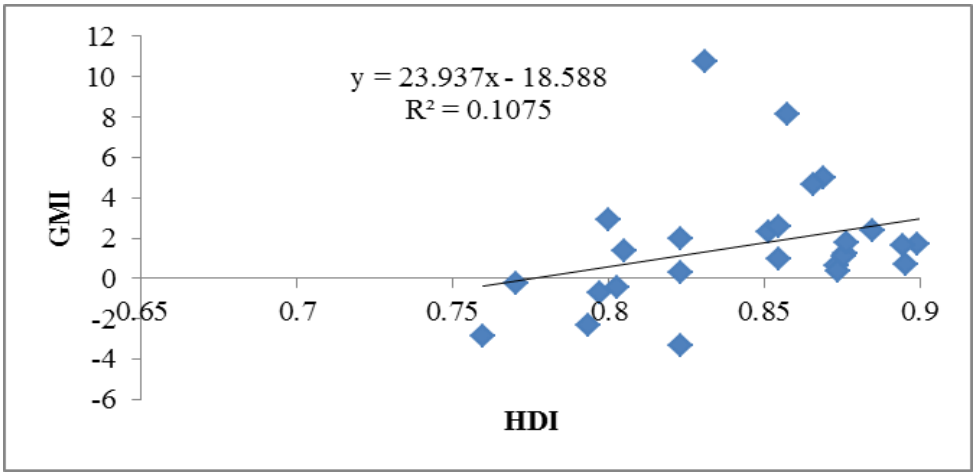
The statistical significance of the T value has been estimated according to formula (6) and its result value is 27.3208. The critical value of Fischer distribution F_α (k, N-k-1) is as follows:

$$F_\alpha (3.27\text{-}3\text{-}1) = 5.1763$$

The result is that, therefore 27.3208 > 5.1763, factors (EI, LEI, II) has statistically significant impact on examined factor GMI.

In the next four graphs is visualized correlation between factors GMI and HDI and GMI and factors EI, LEI and II. From the results from all graphs is obvious that there is a correlation between GMI and individual factors, but this correlation is reduced because of impact of extreme countries.

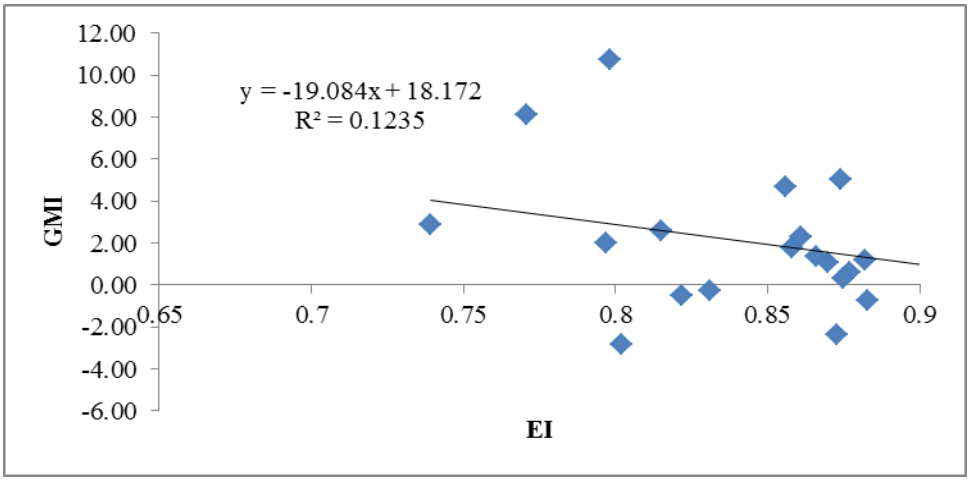
Gr. 1 Correlation between GMI and HDI



Source: own processing.

From the first graph is visible that the coefficient of determination $R^2 = 0.1075$ is low, but even through we can say that there is correlation between these two factors and that the value of correlation is reduced due to impact of countries as Cyprus and Luxemburg with high GMI and relatively high HDI and Estonia with negative GMI and also relative high HDI. These countries are in our case extrem countries. From the growing trend of the line is obvious that with growing HDI grows also GMI in majority of EU27 countries.

Gr. 2 Correlation between GMI and EI

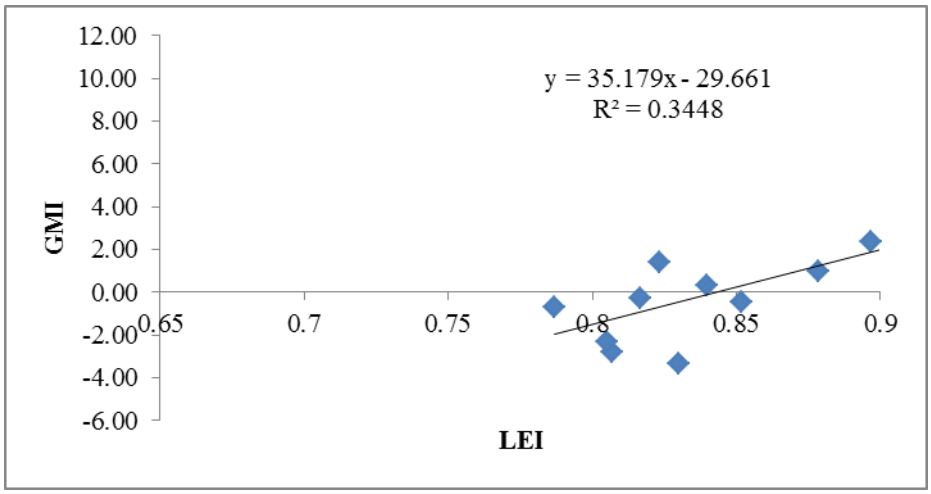


Source: own processing.

Second graf illustrate that correlation between GMI and EI (education). The coefficient of determination $R^2 = 0.1235$ which is also low, but impact of extrem countries which are Cyprus and Luxemburg with high GMI and relatively high EI and on the other hand the of the extreme countries Bulgaria and Latvia with negative GMI, but high EI is not so disturbing as it was in the previous case. As we can see, examined countries of EU27 are more scattered,

than in the previous case, but from the gently decreasing trend of the line is obvious that with growing EI, GMI in some countries of EU27 decrease.

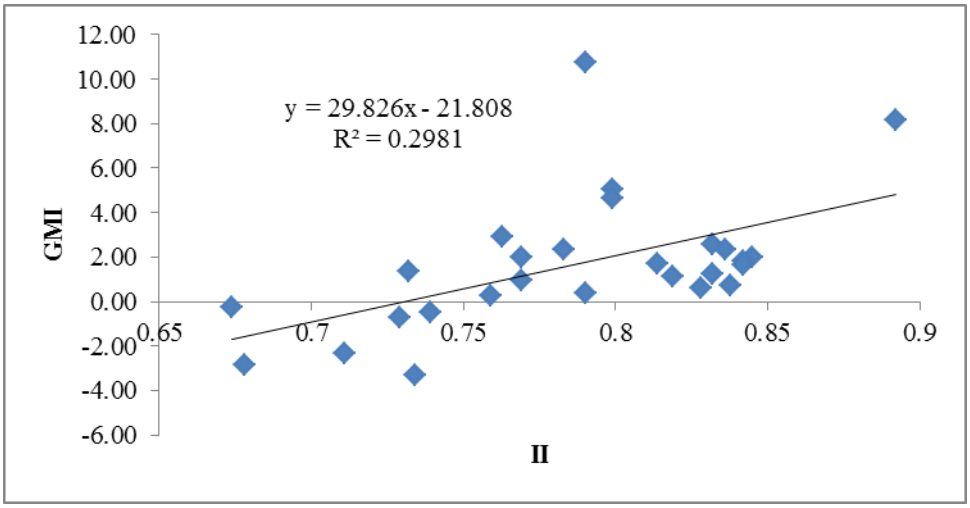
Gr. 3 Correlation between GMI and LEI



Source: own processing.

Correlation between GMI and LEI (health) is visualized in graph 3. As we can see, majority countries of EU27 have relatively high LEI. The coefficient of determination $R^2 = 0.3448$ and is the highest in comparison with other three factors (HDI, EL, II) and we can state that if LEI is growing, GMI is also growing, but on the other hand, this growth is small.

Gr. 4 Correlation between GMI and II



Source: own processing.

The last, but not least graph 4 illustrates correlation between GMI and II (income). The coefficient of determination $R^2 = 0.2981$ and is the second largest. From the growing trend of the line is obvious that with growing II grows also GMI. That means that persons tend to migrate into the countries with higher income. The extreme countries are in this case one

more time Cyprus and Luxemburg which have high GMI and high II and on the opposite site is Estonia with lower II and negative GMI.

Conclusion

The migration is phenomenon which we could examine from different point of views. In our case we have decided to examine impact of selected socioeconomic factors on international migration in the European Union. To these factors belong such as income, education or health and therefore we have decided to analyse the correlation between HDI and GMI. Whereas there is a correlation between HDI and GMI in the EU27 member countries, we have been interested in the deeper reasons of this correlation and hence we have chosen the path analysis that makes it possible. From the partial results is clear that the highest correlation is between GMI and LEI (health) and GMI and II (income). Summarily, we can state that there is a correlation between GMI and all individual factors, but this correlation is especially in first two cases reduced, because of impact of extreme countries as Cyprus, Luxemburg, Estonia, Spain or Italy.

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