“Action and Reaction” – the Impact of European Youth Mobility on the Economy and the Labour Market

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Abstract
Within the framework of the international MOVE project, we are carrying out quantitative data analysis for the countries of the European Union / EFTA to reveal the labour market and economic effects of youth mobility. Following the Introduction, the theoretical framework of youth mobility is described including the centre – periphery model in the analysis of youth mobility, the brain-drain effect involved in youth mobility and the theories dealing with the effect of youth mobility on both labour market and economic growth. Then, two models describing the effects of incoming youth mobility on youth unemployment and prosperity are elaborated upon, in which economic, social and state indicators are also taken into consideration. In the third section, panel OLS regression analysis is used for modelling. 30 European countries are covered with data for ten years (2004-2013). The analyses are carried out for three groups of countries separately: centre-receiving countries, periphery-sending countries and all the EU / EFTA countries included. In the analysis, other economic, social and state indicators that may influence youth unemployment rate and per capita GDP of the receiving countries (such as minimum wages, FDI outward, adult education level or urban population) are controlled for. Our hypotheses include that the increase of incoming youth mobility has a beneficial effect on the labour market and on economic growth, i.e. it decreases youth unemployment and increases per capita GDP in the receiving countries in all the three cases. The next section, “Results of the analysis” reveals that in all the examined country groups, incoming youth mobility decreases youth unemployment rate and promotes economic growth in the receiving countries. Therefore, both of our hypotheses have been failed to be rejected. The Summary section provides the main consequences and conclusions of the analysis. Our results can contribute to the elaboration of the Human Resource Strategy of the European Union. It has become obvious that the benefits in both the sending and receiving countries can be increased by promoting youth mobility. The former model including two actors (the migrant and the receiving country) has been extended with the sending country, the
organizing institution and multinational and domestic companies. From all actors, flexibility is necessary in migration issues to ensure the free movement of potential labour force.

Keywords: mobility; youth mobility; effect of migration; unemployment; GDP

JEL Classification: C23, R23

Introduction

The message sent by Ban Ki-Moon, UN Secretary General, on International Youth Day in 2013 was that ‘Youth Migration Equals Moving Development Forward’ and he called upon the political actors to support youth mobility to maximize the potential for growth in this phenomenon. The international mobility of educated and qualified youth generates global advantages by enhancing knowledge flow and meeting the demand for professional competences. Mobile youths contribute to economic growth and the results achieved of both the sending and receiving country especially on the labour market, in research and development, innovation and enterprise. An environment supporting migration increases the global innovation level and at the same time, it offers an opportunity for poorer countries to obtain both the technologies and products of innovational output (Kuhn-McAusland 2006). The migration pattern of each country changes in space and over time in correlation with their economic development (Melegh 2015). According to De Haas (2007), migration and development are not in a unilateral relationship in which migration influences development but are rather mutually reinforcing. De Haas (2007) differentiates between the described contexts along geographical connections. This is a process striving for a transitory equilibrium, which is made up of the (1) macro-level context of development, (2) the regional development context, and (3) migrant’s own context (e.g. household). In the MOVE project, youth migration was examined within the European Union with this approach. The present study describes our investigation of the effect of youth mobility on unemployment and GDP. The objective of our research is to prove by scientific means that supporting EU youth mobility has a positive effect on society and the economy. The aim of our econometric investigation is to characterise mathematically the economic phenomena, and in addition, to justify or refute, using experiential data,
the economic theories and models. In our paper, our theories related to youth mobility are presented in mathematical formulae, and social and economic data are analysed.

According to our assumptions, the mobility of immigrant youth has a ‘favourable’ influence both on economic growth and on employment. Studies examining the motivations behind youth migration and its effects primarily focus on micro- and mezo levels, and the majority mainly examines migration in a general sense (in relation to the whole population) ignoring the separate analysis of the effect of youth. Therefore, these studies are not suitable for providing sufficient information for shaping youth mobility politics. Considering incoming youth mobility, special attention is devoted to the question whether it has the same positive effect on economic growth and the labour market both in the countries generally known as sending countries and in the receiving countries. Using another result of the MOVE project (This issue contains the paper presenting which countries are considered to be centre-receiving countries and which are considered periphery-sending countries. See article by Daniela Elena Marinescu - Ioana Manafi), according to which youth mobility indicates that receiving countries are those in the centre and sending countries are those in the periphery, it is proved that the positive effect is prevalent in every destination.

Several economists have attempted to prove the relationship between the extent of production and migration (Grossman 1982). Most of them have used the theories of human capital (Rédei 2006). Analysts identify the role of migration in economic growth either in the attained level of human capital, i.e., in the human capital that has been accumulated before (Nelson, Phelps 1966; 1990), or the human capital accumulation taking place in the given period (Lucas 1988). The objective of youth mobility is the accumulation of intellectual/material capital facilitating chances, on the one hand, by the acquisition and absorption of new knowledge and the mutually supplementary innovativeness, and, on the other hand, through their physical presence, they increase the power of each national economy and integration.

In our paper, first, some theoretical questions related to the topic are formulated, which, in our opinion, provide a framework of approach for the research. Next, our model created for the analysis and the methodology of our econometric calculations are presented. After describing our results, they are assessed and evaluated in relation to our starting assumptions and the available research. The models serving as a
basis for our paper have been created by the cooperation of our international research team and they comprise part of the research report published in 2017 (FinalWorkPackageReport WP2).

**Background and notes on the theoretical position of the research**

Our research into youth mobility comprises three main framework elements: (1) With regard to mobility, Europe cannot be considered uniform; (2) one major aspect of the topic is the issue of brain drain (emigration of qualified labour force); (3) the labour market is both a consequence and an effect indicator of the migration processes.

**Centre-periphery theory in the analysis of youth mobility**

The centre-periphery theory was elaborated by Wallerstein (1979) to describe modern world economy. In the receiving countries of worldwide migration, the strengthening of the information economy and a significant concentration of highly qualified human capital can be observed. Several economic and technological activities, such as research and development, activities defining global business politics or activities related to information technology and higher education remain in the centre countries (Hannerz 1992). The theory of Wallerstein is valid not only for the macro-level of the social structure, but it can also be related to the structure of the local economy. (Kincses-Rédei 2010) The centre-periphery effect can also be clearly observed in study mobility. The process is visible geographically in the case of certain universities of some cities in certain countries (Salt, Millar 2007; Rédei 2009). With regard to bank transfers, a similar pattern can be observed; money is transferred from centre countries to periphery countries. Those who live in the centre transfer a part of their income, temporarily or permanently, to their home country. The amount of such transfers equals the amount of direct foreign investments and thus create a global network. Money transfer creates a continuous relationship between home and abroad.

Our analysis of the impact of youth mobility is carried out considering regional aspect. Based on the results of our Romanian colleagues, who examined the patterns of incoming and outgoing mobility with cluster analysis, the labour market and economic growth outcomes are examined separately for centre / receiving countries and for periphery / sending countries.
The first group comprises receiving countries (Austria, Belgium, Denmark, United Kingdom, Finland, France, Netherlands, Ireland, Germany, Italy, Sweden), which are characterised by a low level of youth unemployment, high per capita GDP, high expenditure on social security, a low level of GINI and HDI indices and a low level of at-risk-of poverty. Centre countries typically have high population density, high productivity and high level of pensions. These countries are situated geographically in the centre of Europe and socio-economically are highly developed. In the countries of the second cluster (Bulgaria, Czech Republic, Estonia, Greece, Croatia, Poland, Latvia, Lithuania, Hungary, Malta, Portugal, Romania, Spain, Slovak Republic, Slovenia), the proportion of youth unemployment and the GINI index as well as the proportion of people living at-risk-of poverty are higher while per capita GDP, the expenditure on social security, population density and productivity rate as well as pension costs are lower than in the countries of the first cluster. The second cluster comprises the East European countries, Spain and Portugal. The second cluster is called EU/EFTA periphery-sending countries. The third cluster includes Norway and Luxemburg (Owing to the high number of missing data, Switzerland was left out of the cluster analysis), with an outstandingly high GDP and half youth unemployment rate. Our analysis revealed that these clusters have been constant in the past ten years. The only change seems to be that since 2010 Spain has been in the second cluster and not in the first one, where it belonged before. The situation of the rest of the countries has not changed during the analysis period.

Our research tests the hypothesis that the effect of incoming youth mobility is positive on both the receiving and sending groups of countries.

The effect of brain drain on youth mobility
Losing the most talented and highly qualified workforce owing to their migration is mostly characteristic of developing countries. Docquier and Rapoport (2012) studied the pull factors of brain drain, and they pointed out that this is a dominant phenomenon of international migration and a major element in globalisation. A greater proportion of well qualified, healthy young people choose to work abroad for the purpose of further development (Dodani, Laporte 2005; Golovics 2014). A lot of research has focussed on the causes of brain drain. They have found that target countries are keen to receive highly qualified experts, which has an effect
on the labour market in both sending and receiving countries. (Docquier, Marfouk 2006; Golovics 2015). The immigrants are often younger than the population of the receiving country, which makes the human capital younger in the short run, but the long term effect depends on what the immigrants think about establishing their own family. Immigrants are often well qualified and have fewer children but provide their children with excellent opportunities for education and living conditions. (Urbánné Mező, Udvari 2016).

In this research, we test the hypothesis that incoming youth mobility as auxiliary intellectual capital has a clearly positive effect on the receiving countries.

The effect of mobility on labour market and economic growth

The literature about the effect of migration on the labour market is abundant and expanding. Its majority, studying the macro-economic models of labour demand and aggregate offer, points out that migration affects both wages and employment (Battisti et al 2014; Borjas 2015; Docquier et al. 2014; Ottaviano, Peri 2012). According to our hypothesis, youth mobility has an effect on employment; however, it does not displace young domestic workforce but rather reduces unemployment by complementing them. 21st century discourse on human resources assessment talks about the merits of experiences gathered in several geographical areas with regard to the labour market, too, and attributes outstanding significance to the social capital evolving in this way (Rédei 2005), which young people create during their mobility. Using an empirical analysis, others (Scheve, Slaugther 2001; Mayda 2006) examined if the population of the receiving country feels threatened by the labour market competition appearing due to emigration (Hárs 2012). The answer to this question is very often politically and emotionally charged. D’Hombres and Nunziata (2016) found that immigrants and locals complement each other rather than push each other out in the labour market of the receiving country. Marr and Siklos (1994, 1999) also proved that changes in the migration rates do not increase unemployment. Young people are able to integrate rapidly into the economy, and research and development activities may be enhanced, and the number of enterprises may increase as qualified migrants increase creativity, and thus technology level increases due to the incoming knowledge and know-how. (Rédei 2005)
On the basis of the above, it is assumed that the potential effect of incoming migration on labour market characteristics depends on the fact whether the incoming youths have skills, competences and knowledge which can replace or supplement those of the domestic workforce. If the skills, competences and knowledge are replaceable, the incoming workforce will increase the labour market supply and wages will decrease in the short run. The increased labour market supply may increase unemployment and inactivity if the existing workforce is not willing to accept lower wages. If the skills, competences, knowledge and experience of existing and incoming workforce supplement each other, labour market competition will not increase but productivity will, which then will result in the increase of wages (Borjas 1995; Ruhs, Vargas-Silva 2015). The increase in productivity will induce an increase in economic growth. If the short term mobility of incoming youths in Europe increases the rate of unemployment, eliminating the effects of economic (GDP, FDI, real minimal wages), and social indicators (urban population, education level), the competences of the existing workforce and the incoming workforce primarily replace each other. However, if the short-term mobility of youths increases market price GDP eliminating the effects of economic (FDI) and social indicators (urban population, education level, HDI), this means that the existing and incoming workforce are primarily supplementary to each other. Therefore, it is assumed that incoming mobility does not increase unemployment in the case of the young generation but rather results in the increase of per capita GDP. According to our hypothesis, mobility is circular, i.e., those outgoing are replaced by the incoming workforce arriving from other areas in the case of young people. This reinforces the fact that the competences of the incoming youth and those of the existing workforce primarily supplement each other, which means that the supplementary effect outweighs the effect of replacement.

**Modelling and research methodology**

Based on the outlined theories and research, the effect of incoming youth mobility on the receiving country’s unemployment and economic growth is analysed. The analyses are carried out for three groups of countries: the 30 EU/EFTA countries involved in the study, the centre (receiving) and the periphery (sending) countries. On the one hand, the effect of incoming youth mobility on the receiver country’s unemployment
(namely, on the unemployment rate of youth) is examined. For the model calculations, the effect of such indicators as GDP, urban population, real minimal wages and education level was also considered in order to control for the effect of these factors from the examination of the impact of incoming youth mobility on unemployment (Figure 1). (move-project.eu)

The other part of our research comprises the analysis of the impact of incoming mobility on the receiving country’s economic growth. In the impact analysis with regard to per capita GDP, in addition to the data of incoming youth mobility, economic parameters such as FDI, and the proportion of those working in companies in foreign ownership, as well as social parameters such as the education level of the adult population, and the human development index (HDI) are taken into account in our model for the purposes of controlling for other socio-economic effects (Figure 2). (move-project.eu)
Panel data (also called longitudinal or cross-sectional timeline data) refer to a dataset in which the behaviour of entities or variables is observed over time. In our case, various different variables were measured for a ten-year period in 30 different countries, as macro-economic data from 2004-2013 of 30 countries were used for this research (Cyprus was omitted from the analysis due to its outstandingly high values), which were supplemented with the mobility data of the generation aged 15-29 years for the same period. We consider the sample a total population since it includes the data of all member states of the European Union and EFTA (the list of countries involved in the analysis can be found in the introduction).

Model calculations were started by defining the delay times since modern econometric calculations all take into account the optimal time lag with which the maximum effect of the examined impact can be observed (Bell, Jones 2014; Browne, Draper 2006). An optimum value of delay between the economic and social parameters can always be calculated, namely, it can be calculated how long it would take for the impacts to become discernible. To define the delay, the method of the ordinary least squares (OLS) was applied because this helps define the strongest relationship by minimising the sum of the squares of the differences between the values.

The time lag analysis has shown significantly that with a high coefficient of correlation, immediate impacts can be observed in the samples, therefore the optimal delay was defined as 0 year. On its basis,
it can be stated that reacting to the change in incoming youth mobility, the labour market and economic growth change rapidly, which supports several previous research works.

Changes in the parameters included in the examination is important for the analysis of processes. The descriptive statistical analysis of the variables used for the model can be found in Table 1.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Average</th>
<th>Deviation</th>
<th>General trend</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2004</td>
<td>2013</td>
<td>2004</td>
</tr>
<tr>
<td>GDP (calculated at market price, EUR / head)</td>
<td>21636.67</td>
<td>27417.86</td>
<td>14564.91</td>
</tr>
<tr>
<td>FDI (in percentage of GDP)</td>
<td>41.82</td>
<td>76.50</td>
<td>36.60</td>
</tr>
<tr>
<td>Real minimal wages (USD, PPP)</td>
<td>13119.79</td>
<td>13937.88</td>
<td>5976.05</td>
</tr>
<tr>
<td>Urban population (in percentage of total population)</td>
<td>72.42</td>
<td>74.05</td>
<td>11.87</td>
</tr>
<tr>
<td>Education level of the adult population (the rate of those with higher educational qualification among the population aged 25-64 years)</td>
<td>24.41*</td>
<td>31.13</td>
<td>7.40</td>
</tr>
<tr>
<td>Youth unemployment rate (in percentage of the working age population of 15-24 years of age)</td>
<td>18.48</td>
<td>25.58</td>
<td>7.21</td>
</tr>
<tr>
<td>Mobility of incoming youths (the rate of those coming from EU-28/EFTA countries for one thousand inhabitants aged 15-29 years)</td>
<td>9.63</td>
<td>15.62</td>
<td>5.33</td>
</tr>
<tr>
<td>HDI</td>
<td>0.84*</td>
<td>0.86</td>
<td>0.05</td>
</tr>
<tr>
<td>Proportion of those working for companies in foreign ownership (in percentage of the total domestic workforce in employment)</td>
<td>17.55*</td>
<td>18.69</td>
<td>6.76</td>
</tr>
</tbody>
</table>

*: The first year: 2005

Table 1. Descriptive statistics of the parameters used (Source: own calculation)
In our research, the young people are considered as incoming youth mobility who migrated from a EU-28/EFTA country to another EU-28/EFTA country, live in this other country for less than three years and do not have the citizenship of this country. While collecting these data, the causes of and reasons for mobility were not examined, therefore they cannot be analysed, either.

A specific problem related to the analysis of mobility data is that the reliability of the data is not adequate. (Hautzinger et al. 2014; Demográfia.hu 2014, The document entitled ‘SEEMIG Nemzeti stratégia a migrációs adat-előállítás és adathasználatt fejlesztésére’ (Strategy for the development and usage of data on migration’ was elaborated in the work package 'Strategies, Capacity Building and Cross-border Dialogue’, coordinated by the University of Trento within the framework of strategic project ‘SEEMIG – Managing Migration and its Effects in South-East Europe – Transnational Actions Towards Evidence Based Strategies’, financed by the European Union’s South-East-Europe programme (Project identification number: SEEMIG - SEE/C/0006/4.1/X)). For the analysis presented in this paper, the database created in the MOVE project (The data tables were created by one of our German partners, DJI (Deutsches Jugendinstitut, using data supplied by EUROSTAT) based on the workforce survey dataset by EUROSTAT was used. Statistics usually consider young people under 25 as youths from the aspect of employment. By the 21st century, however, it has changed, so youths have been defined as young people under the age of 29 years.

Methodology
To define optimal delay, fixed effects model regression analysis was carried out, in which the result of the Hausman-test and a VIF (variance inflation factor) index were taken into consideration to test collinearity, and also, the value of Durbin-Watson test function, which tests autocorrelation. The significance of the Hausman test for each model was lower than 0.05, therefore we decided to use the fixed effects model for each case. Multicollinearity was considered acceptable as the VIF value was under 10 (Studenmund 2006).

In the calculations, the significance levels of the coefficients of each variable were not examined as no conclusions were made for the population on the basis of a sample, but as indicated above, the data of
each member in the country groups comprising the subject of the study (European Union and EFTA member states) were included.

For the model calculations, GRETL 7 for Windows and IBM SPSS software were used.

The result of modelling

Modelling has been performed for three groups of countries, as described above. First, the impact of incoming mobility on the rate of youth unemployment, then on economic growth broken down for each of the three groups of countries is presented: the analysis including all the examined EU/EFTA countries is followed by that of the centre, and then of the periphery countries.

The impact of incoming mobility on unemployment

Studying the impact of incoming mobility on youth unemployment, it can be concluded that the coefficient of determination ($R^2$) for each of the three groups of countries is high (above 70%). Since the influences within the countries played a significant role in the panel models (as the data of 10 years were analysed in the case of each country), we must be cautious with any conclusion concerning the explanatory power of $R^2$. The value of VIF was acceptable for each variable (namely, it was under 10) therefore none of the variables had to be excluded from the model due to high multicollinearity. To examine autocorrelation, the Durbin-Watson test was carried out, which despite not yielding clear results did not lead to the elimination of variables from among the model parameters for the purpose of ensuring the completeness of the research.

As seen in Figure 3, the increase of incoming youth mobility reduces unemployment among young people in all the countries included in the study, controlling for the effect of other economic (GDP, FDI and real wages) and social factors (proportion of urban population and education level of the adult population). The increase of incoming mobility of young people by one percentage point will reduce the youth unemployment rate by 0.1 percentage point according to the model. In addition, the rate of youth unemployment will also be reduced by per capita GDP. The increase of real minimal wages, however, will increase youth unemployment, which means that in this case the correlation is positive. Considering the social variables, we can state that both the
education level of the adult population and the proportion of urban population are proportionate to youth unemployment.

In the case of the centre countries, the increase of incoming youth mobility also reduces the rate of youth unemployment, controlling for the effect of other economic and social factors. According to the model, the increase of incoming mobility of young people by one percentage point will reduce the youth unemployment rate by 0.1 percentage point in this case, too. Besides, per capita GDP, FDI and the proportion of urban population is proportionate to youth unemployment, as well.

In the periphery countries, the increase of incoming youth mobility also reduces the rate of youth unemployment. Each economic parameter examined here (GDP, FDI, real minimal wages) is inversely proportionate to youth unemployment whereas the proportion of urban population and the level of education of the adult population are proportionate to it.

In the case of incoming mobility affecting economic growth, the coefficient of determination ($R^2$) is higher than 90% for each of the three groups of countries. However, in this case, too, we must be cautious with any conclusion concerning the explanatory power of $R^2$. The values of Durbin-Watson statistics are around 2 thus it can be presumed that there is no autocorrelation in the data series. The value of VIF indicator was under 10 in the case of each variable used in the calculation, which means...
that none of the variables had to be excluded from the model due to high multicollinearity.

In the case of all the countries included in the study, the increase of incoming youth mobility increases the GDP controlling for the impact of other economic (FDI and minimal wages) and social factors (proportion of urban population and education level of adult population). Based on the model, the increase of incoming youth mobility by one percentage point will increase economic output by 0.05 percent on the average. Both economic parameters included in the investigation (FDI and the number of employees working for companies in foreign ownership) have a negative impact on GDP. The education level of the adult population increases while HDI decreases GDP (Figure 4).

The increase of incoming youth mobility in the centre countries enhances economic growth (the value of the coefficient is 0.001) as well as the employees working for companies in foreign ownership, HDI and the education level of the adult population. The increase of FDI, however, decreases economic growth.

In the periphery countries, the study of the potential impact of youth mobility on economic growth shows that not only the mobility of incoming young people relates positively to GDP, but also the education level of the adult population as well as HDI, whereas FDI and the employees working for companies in foreign ownership are inversely proportionate to GDP.

Fig.4.
Model results of the impact on per capita GDP
When analysing the clusters, you can notice that the mobility of incoming young people reduces unemployment both in centre-receiving countries and in periphery-sending countries. The increase of incoming short-term youth mobility by one percentage point will decrease the unemployment rate of young people by 0.11 percent in the centre-receiving countries and by 0.09 percentage point in the sending-periphery countries (Table 2). The beneficial impact of incoming youth mobility with regard to the unemployment rate is stronger in the more developed centre-receiving countries. It must be noted, however, that the impact is stronger in the periphery-sending countries if it is about the GDP and not about unemployment. The increase of incoming youth mobility in the centre-receiving countries by one percentage point will increase GDP by 0.01 percent on average, while the increase is 0.04 percentage in the periphery-sending countries. The reason for the difference may be due to the fact that with a lower initial level of economic growth, a higher percentage rate of growth is more feasible than with a higher starting level.

<table>
<thead>
<tr>
<th>Short term incoming mobility</th>
<th>EU/EFTA centre-receiving countries</th>
<th>EU/EFTA periphery-sending countries</th>
<th>Total sample</th>
</tr>
</thead>
<tbody>
<tr>
<td>Youth unemployment rate(^1)</td>
<td>↓ (0.11%)</td>
<td>↓ (0.09%)</td>
<td>↓ (0.12%)(^3)</td>
</tr>
<tr>
<td>GDP(^2)</td>
<td>↑ (0.01%)</td>
<td>↑ (0.04%)</td>
<td>↑ (0.05%)(^4)</td>
</tr>
</tbody>
</table>

\(^1\) Eliminated variables: per capita GDP, FDI, real wages, proportion of urban population, education level of adult population

\(^2\) Eliminated variables: FDI, real wages, proportion of urban population, education level of adult population

Table 2. Summary of the model results of the impact on young unemployment rate and per capita GDP (Source: own table).

**Summary**

The result of the model calculations that the incoming youth mobility affects employment by reducing unemployment supports the research results of Battisti et al. 2014; Borjas 2015; Docquier et al. 2014; and Ottaviano, Peri 2012. In all the three examined cases, incoming youth mobility reduced young unemployment (Table 2), which corresponds to our hypothesis. This is a significant effect because it can contribute to
the preservation of human capital, which will be diminished when not used properly.

The other important result of our analysis is that incoming youth mobility increases per capita GDP controlling for other socio-economic effects (Table 2). It implies that incoming youth mobility may contribute to economic growth and social development. This means that the skills, competences, knowledge and experiences of the incoming youth supplement the skills and competences of the existing workforce to a great extent, which increases productivity and thus enhances economic growth. This proof of the impact of mobility on economic growth is contrary to the conclusions of Bouhtane et al. (2013) who did not find any relationship between the two indicators.

Our hypothesis that the incoming youths will replace the outgoing youths has not been rejected. The incoming young people will replace the outgoing ones in a way that their competences are different, probably higher than those of the outgoing young people.

It has also been found that the competences of the incoming youth and those of the existing workforce supplement rather than replace each other. This confirms the research results of D’Hombres and Nunziata (2016).

In our analysis, we concentrated on the short-term effects, and the short-term impact of youth mobility on youth unemployment and GDP. However, in the long run, the two cases are interrelated as the growth of GDP may create new demand on the market, which then may improve labour market balance and therefore reduce unemployment.

We hope that our macro-economic analysis will support the effort to emphasise the factors which contribute to the sustainable development of the European Union through early 21st century youth mobility in Europe on the one hand, and on the other hand, provide data for the primary research into individuals’ decision making through the examination of the causes and reasons. With these results, we contribute to elaborating a Human Resources Strategy for the European Union which prioritises the political ideas concerning young people in which the adequate control of all types of youth mobility is a key element (Tan 2008). Despite the difficulties, it is clear that mobility produces profit. By promoting the international mobility of young people, the profit to be gained in the sending and receiving countries can be increased. The earlier two-player model (of migrant and receiving countries) of the initial bargaining position will be extended with the sending country, the
organising integration and the multinational and domestic companies. In
the issue of migration, flexibility providing free movement of potential
labour force is necessary for each actor – which requires further
negotiations and adjustment. For the process of mobility turning more
and more beneficial, the location of receipt, as the regional level, has
entered the complex relationship as the umpteen factor. Thus, the
subsidiarity as well as the central promotion of migration will both be
strengthened.

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Appendix

Table A1. Results of panel analysis for Model 1.
‘Youth unemployment rate’ for two clusters and for the whole sample (Impact on young unemployment rate) in case of cluster 1 and 2 and the total sample.

<table>
<thead>
<tr>
<th></th>
<th>Dependent variable: Youth unemployment rate</th>
<th>EU/EFTA centre-receiving countries&lt;sup&gt;1&lt;/sup&gt;</th>
<th>EU/EFTA periphery-sending countries&lt;sup&gt;2&lt;/sup&gt;</th>
<th>Total&lt;sup&gt;3&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Explanatory variable</strong></td>
<td><strong>Coefficient</strong></td>
<td><strong>p-value</strong></td>
<td><strong>VIF</strong></td>
<td><strong>Other indicators</strong></td>
</tr>
<tr>
<td>Short-term incoming mobility</td>
<td>−0.111</td>
<td>0.004</td>
<td>3.532</td>
<td>Dw-test</td>
</tr>
<tr>
<td>Per capita GDP</td>
<td>−2.138</td>
<td>&lt;0.0001</td>
<td>2.644</td>
<td></td>
</tr>
<tr>
<td>FDI - outgoing</td>
<td>−0.028</td>
<td>0.277</td>
<td>4.111</td>
<td></td>
</tr>
<tr>
<td>Real minimal wages</td>
<td>1.558</td>
<td>0.148</td>
<td>1.299</td>
<td></td>
</tr>
<tr>
<td>Proportion of urban population</td>
<td>−0.006</td>
<td>0.861</td>
<td>1.666</td>
<td>R&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Level of education</td>
<td>2.283</td>
<td>&lt;0.0001</td>
<td>2.268</td>
<td></td>
</tr>
</tbody>
</table>

Note: DW-test denotes the Durbin-Watson test.

1 Fixed effects model, 11 countries (DE, AT, BE, DK, FI, FR, IE, IT, NL, SE, UK), 6 explanatory variables, 11 years
2 Fixed effects model, 15 countries (HU, RO, ES, BG, HR, CZ, EE, EL, LV, LT, MT, PL, PT, SK, SI), 6 explanatory variables, 11 years
3 Fixed effects model, 30 countries (DE, AT, BE, DK, FI, FR, IE, IT, NL, SE, UK, HU, RO, ES, BG, HR, CZ, EE, EL, LV, LT, MT, PL, PT, SK, SI, LU, NO, CH, IS), 6 explanatory variables, 11 years

Table A2.
Results of panel analysis for Model 2. (Impact on per capita GDP) in case of cluster 1 and 2 and total sample. (Impact on young unemployment rate) in case of cluster 1 and 2 and the total sample.

<table>
<thead>
<tr>
<th>Dependent variable Per capita GDP (Euro)</th>
<th>EU/EFTA centre-receiving countries¹</th>
<th>EU/EFTA periphery -sender countries²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explanatory variables</td>
<td>Coefficient</td>
<td>p-value</td>
</tr>
<tr>
<td>Short-term incoming mobility</td>
<td>0.001</td>
<td>0.952</td>
</tr>
<tr>
<td>FDI – outgoing</td>
<td>−0.276</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Proportion of employees working for companies in foreign ownership</td>
<td>0.005</td>
<td>0.747</td>
</tr>
<tr>
<td>Human Development Index</td>
<td>0.718</td>
<td>0.711</td>
</tr>
<tr>
<td>Education level</td>
<td>0.868</td>
<td>0.009</td>
</tr>
<tr>
<td>Iskolázottság szintje</td>
<td>2.155</td>
<td>&lt;0.0001</td>
</tr>
</tbody>
</table>

Table A3.
Results of panel analysis for Model 3. (Impact on young unemployment rate) in case of cluster 1 and 2 and total sample.

<table>
<thead>
<tr>
<th>Total³</th>
<th>Proportion of employees working for companies in foreign ownership</th>
<th>4.044</th>
<th>R²</th>
<th>0.990</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Human Development Index</td>
<td>3.503</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education level</td>
<td>3.534</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Short-term incoming mobility</td>
<td>1.566</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>FDI – outgoing</td>
<td>4.574</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Proportion of employees working for companies in foreign ownership</td>
<td>1.820</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Human Development Index</td>
<td>1.377</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Education level</td>
<td>3.975</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

³Fixed effects model, 30 countries (DE, AT, BE, DK, FI, FR, IE, IT, NL, SE, UK, HU, RO, ES, BG, HR, CZ, EE, EL, LV, LT, MT, PL, PT, SK, SI, LU, NO, CH, IS), 5 explanatory variables, 11 years

Fixed effects model, 11 countries (DE, AT, BE, DK, FI, FR, IE, IT, NL, SE, UK), 5 explanatory variables, 11 years

Fixed effects model, 15 countries (HU, RO, ES, BG, HR, CZ, EE, EL, LV, LT, MT, PL, PT, SK, SI), 5 explanatory variables, 11 years